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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, JULY 4, 1891.

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Tuscarora, Nevada.

[Written for the PRESS.]

The picturesque little town of Tuscarora nestles at the foot of the lofty Mount Blitzen. It is bordered on the east and west by rolling hills, which gently slope into the beautiful Independence Valley through which the Owyhee river courses leisurely. This town, noted for its rich silver mines, is located in the northeastern part of Nevada. The summers are short and very dry, as but little rain falls in this region, consequently there are but few clouds to obscure the hot, dazzling sun, which shines in all its glory upon the fragrant sagebrush and brilliant cacti. Tuscarora probably owes its existence to the discovery of the Grand Prize mine, which was located by an old prospector, who has long since rested under the sod.

There was one who in those early days held the position of Superintendent of the Prize—as it was generally called—who has also crossed the mystic river. His name was Jerry Dayton.

There was not a man about the works but welcomed his coming, there was scarcely an nohln in the streets but expected to hear his merry "good morning." It was with regret his employees heard of his resignation, for after that he took up his residence in the Golden State. On several occasions he was met on the streets of San Francisco by some of his former employees, who informed him of their financial embarrassment. Without a word, he slipped his hand into his pocket and brought forth the shining dollars, and gave them without the least reluctance.

The vacancy made by Mr. Dayton's resignation was filled by Mr. J. E. Dixon, who also gained much popularity by his conscientious scruples and geniality.

The Grand Prize, together with many other mines, yielded valuable ore abundantly, thereby giving employment to hundreds of men,



NAVAJO AND INDEPENDENCE MILL.

who, until 1884, received for their labor \$4 per day. But when silver declined, wages were reduced to \$3.50 per day.

Although the Prize has more than likely seen its best days, there are many other mines in Tuscarora which are yet in their infancy, among which may be mentioned the Navajo, Commonwealth, North Commonwealth, Bell-

Isle, North Bell Isle, Nevada Queen, Del Monte, Diana and Dexter.

The Navajo prospered for years under the superintendency of W. C. Price, who is now a resident of Oakland, having resigned in favor of R. M. Catlin, who is a well-known and respected citizen, possessing more than ordinary ability, as well as being a man of intelligence

and education. He is very ingenious, having lately invented a gun, for the patent of which he is offered \$30,000.

Some of the above mentioned mines are superintended by H. T. Coffin, who has gained the confidence of the community, and discharges his duties in a manner that would do credit to a man twice his years.

The photographs sent are those of the Navajo and Independence mill and the Grand Prize mill. The latter has been idle some time, but the company has a complete concentrating plant and the concentrated ore is worked at the 20-stamp Union mill. This Union mill of Tuscarora is owned by the Commonwealth Con., North Belle Isle and Nevada Queen Companies, and is now doing most of the work of the district. The Navajo-Independence mill of 10 stamps has been idle for some months, but may start up soon on Belle Isle ore. They have at this mill two Howell-White furnaces, and by a double roasting process adopted, have succeeded in obtaining results as high as 92½ per cent.

Although this town has a population of but about 1500 inhabitants, it can boast of the progression of its temperate and industrious people.

One of the brightest of Nevada's young men, Geo. W. Peltier, resides at Tuscarora. When he had scarcely attained his majority, he distinguished himself as being a thorough business manager, and it is due to his perseverance, energy and good management that he has attained success. Although he, together with other persons who have controlling interests in Tuscarora, have at times been criticised severely, yet there is scarcely a laboring man there who will confess that, so long as he is compelled to work for wages, he would prefer Tuscarora to any other mining town on the coast.

(Continued on page 9.)



GRAND PRIZE MILL, TUSCARORA, NEVADA.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Golden Era Mine.

(From our Traveling Correspondent.)

EDITORS PRESS:—Leaving Columbia, Tuolumne Co., I drove out through the small but fertile fruit ranches that skirt the town, until the road wound down the mountain side to the Davis mine, where I exchanged my cart for a saddle and continued on my way over a mountain trail. Immediately below was a new road in the course of construction to the mining and lumbering sections above. Far below wound the south fork of the Stanislaus river. Swollen by the melting snows, the stream splashed, churned and dashed against its boulder bed as it sped on its way to the sea. Above, below, and on every side the forest trees, as yet untouched by man, covered the rugged mountain sides with their green leaves and waving limbs. Now the trail ascended rapidly, and you look far down the mountain's precipitous sides and wonder whether if your horse lost his footing, and you started down, down, down, would you know when you got there. But the summit is reached, and as you look away beyond at the tree-clad mountains, with the river winding its silvery way at their base, all thoughts of fear give way to one of admiration if not veneration. But all things have an end, and before the distance seems half covered, the horse stops at the Golden Era mine, commonly known as the Page mine.

The genial Superintendent, Mr. H. F. Lucas, extends a hearty welcome, and soon the wants of man and beast are well cared for. Night soon sets in and then the elements turn loose, in the heaviest downpour of the season. Occasional flashes of lightning followed by peals of thunder seem to further liberate the flood, but we are warmly and comfortably housed and so sleep all the sounder for "The patter of the rain upon the roof."

Daylight finds us out, and as the sun drives away the mists, the mountains loom up grandly in their rugged beauty. Breakfast over, we wend our way up the trail to the mine.

The Golden Era mine is located near the summit of the mountain on the south side of the south fork of the Stanislaus river and is distant 11 miles northeast of Sonora. The course of the vein is that of the mountain, also northeast and southwest. The vein crops over 1000 feet above the river, thus affording unusual facilities to tap the vein from the precipitous sides of the mountains. Previous to the purchase of the mine by the present owners, it had been operated by Mr. Page and his partners who developed the mine as I found it. In their work they had not differed from the usual experience of the miner; the five-stamp mill was erected without mishaps, and the battery soon had a lien on the mine that made it impossible to work but three of the stamps. No arrangements were made to save the sulphurets, and in this crude, wasteful way, the ores of the mine were milled. Notwithstanding the loss which must have resulted, the owners were able to show handsome receipts for \$30,000 from 2000 tons of ore extracted and milled. By reason of the size of the vein and extent of ore developed, it is difficult to see where the ore was extracted.

The vein is opened by two shafts from the surface to a depth of 112 and 125 feet and show from two to eight feet of finely ribbed quartz. Two crosscut tunnels have been driven to connect with the shafts. The north tunnel is 170 feet long and taps the vein at a depth of 125 feet. From this a drift has been run south 112 feet on the vein, which shows an average width of three feet, all fine-grained, ribbed quartz, enclosed in solid smooth walls of metamorphic slate, with a good gouge on both walls and more or less dyke matter. In this drift a space 80 feet long and 30 feet high has been stoped; the balance of the ore is intact. The south crosscut tunnel is 108 feet long, and cuts the vein 112 feet deep. From the point of intersection a drift has been driven southwest 110 feet. The vein throughout the drift averages four feet in width all fine ribbon quartz. The only ore extracted from this drift is that taken from a small stop 10x12 feet. From the bottom of this drift, a winze has been put down 30 feet, which shows very high-grade ore, much more heavily sulphuretted than that in the drifts. Back of this vein runs a parallel one, which is out in the north drift by a four-foot crosscut. The vein is three feet wide, of granular quartz carrying free gold. The nearness of this vein points conclusively to the fact that in another 100 feet in depth it will come in and swell the main vein to twice its present proportions. The ore in the drifts is all similar in character, not alone in the length of the workings, but in the width of the vein as well, which is unusual for ribbon quartz. The vein matter carries bright free gold, and iron and galena sulphurets. The present owners, before purchasing, sampled the vein thoroughly, and shipped the ore to Denver for treatment. The results far exceeded their most sanguine expectations, and showed \$32 a ton in free gold, and \$300 a ton as the value of the sulphurets. The percentage of sulphurets is not large in the present workings, but the short winze ank shows that they are rapidly increasing in depth. The host feature of the mine is this: The entire vein, for the

whole length of the workings, is above average milling value. In consequence, there is no waste quartz, and by reason of the width of the vein, no dead work. From the drifts, the track leads direct to the mill. The old mill has been set upon its feet again, and made as new; a Pelton water-wheel put in and concentrators added. When complete, there will be little else than the old battery remaining of the old mill. The mill is of five stamps, and will be used to thoroughly test the ores of the mine.

Mr. Lucas intends to connect the drifts, and will then have the vein opened to an average depth of 119 feet and 335 feet on the vein. At the same time the drifts will be driven ahead, and the winze put down. When the vein at this station is thoroughly developed, a crosscut tunnel 300 feet long will be driven 450 feet below the present workings. From this point, the vein will be extensively exploited, and a large mill erected capable of handling the ores of the vein rapidly, economically and successfully. This lower tunnel will no doubt find the two upper veins united, and make an eight-foot vein of ore that at this depth (568 feet) will probably be handsomely charged with sulphurets. The mine owns an excess of free water, with a fall of 200 to 500 feet, and all of the timber the mine can ever use, which added to the size of the vein, the ease with which the vein matter breaks and mills, the firmness of the walls, and the economy of operating by tunnel make it possible to mine and mill the ore for less than \$3, as at present equipped; and when the larger plant is erected, bring this sum down to \$2 a ton. Attention was first called to this vein through the richness of the gulches below it, in placer gold pieces, realizing \$78, having been extracted. This came from the surface croppings, which, with the exception of the two shafts have not been explored. The mine is a full location of 600x1500 feet with an additional mill site and 160 acres of timber and farm land, recently acquired on the summit of the mountain and directly above the mine. The superintendent's cozy residence, the boarding-houses and stables are just below the mill, on a little bench, while the mountain continues on down to the river, far below. At present the mine is reached by wagon-road via Sonora and Hyde mine or via Columbia and Yankee Hill road. A new road is now in course of construction from Columbia direct to the mine which, when completed, will bring the mine within six miles of Columbia, passing through one of the most picturesque sections in the State.

That the mine has not been bought by capitalists before is from no fault of the mine itself, or want of desire on the part of mining operators, but was due to the fact that it was considered and heretofore found impossible to secure satisfactory terms and conditions from the owners. Mr. Lucas brought his long experience and business tact to bear, and in this as in all else, succeeded. The company is fortunate in its superintendent—a gentleman "perfectly white," a fine linguist, who has mined in all parts of the United States, is thoroughly familiar with all the details of the business, and endowed with unusual business ability. Under him the Golden Era with its large vein of high-grade, free-milling ore, coupled with the unusual advantages the mine possesses in situation, free water and free timber, all in a favored climate where mining can be conducted every day in the year, make it not only probable but undoubtedly a fact that the Golden Era will exceed in value the old and famous Dead Horse mine of this county, which, with its four-foot vein of \$6 ore made its fortunate owners millionaires.

E. H. SCHAEFFLE.
Ex. U. S. M. E.

California Mining Interests.

EDITORS PRESS:—It seems to me the position you have taken as regards the mineral exhibit for the world's fair, is decidedly wrong, and will not be seconded by the miners of this State. To pack up and transport the collection of the Mining Bureau or that of the State University, is to break up and destroy both. The Mining Bureau might as well close its doors as to consent to its removal. The move is a well-devised plan, however, to save drawing from the \$300,000 appropriation, the \$50,000 due the mining industry, for making a collection.

It is very clear that the powers that be, are figuring, simply, to use the mineral exhibit as a cat's paw for other special interests, for there seems a desire to hoodwink every interest, at the expense of mining, and yet every potato raised or orange plucked is for gold. The Grangers killed the goose and the State has lost a product of nearly \$80,000,000. The State is languishing for the want of money, but the very interest that produces it receives no favors. Manufacturers are half-handed, and yet more immigration is called for. For what? To reduce the State to greater poverty, and to have more crosses heaped upon it? What California wants is to produce more gold and silver, then she has sold backing for all the "blow," without it every industry is crippled. There is one thing Californians forget, and this is, California is only great among Californians.

When California gives more attention to her material interests, and less to speculation and blow, then we need not care. Put every hydraulic and gravel mine to work under just

and equitable laws. To say that debris cannot be retained is to question the engineering skill of the age. Open our quarries and utilize them in our buildings. Open our iron mines and make our machinery of California iron. Give encouragement to the miner, and he will fill your coffers with gold and silver.

ALMARIN B. PAUL.
Middle Creek P. O., Shasta Co., Cal.

Curious Facts About Seas.

The oceans and seas are the great reservoirs into which run all the rivers of the world. They are the cisterns which finally catch all the rain that falls not only upon their own surface, but upon the surface of the land as well. All this water is removed again by evaporation as fast as it is supplied, it being estimated that every year a layer of the entire water surface of the globe over 14 feet thick is taken up into the clouds to fall again as rain.

The vapor is fresh, of course, and if all the water of the oceans could be removed in the same way and none of it returned it is calculated that there would be a layer of pure salt 230 feet thick left in the bottoms of these great reservoirs. This is upon the supposition that each three feet of ocean water contains one inch of salt, and that the average depth of all oceans is three miles.

At a depth of 3500 feet the temperature is uniform, varying but a trifle between the poles and the equator. In many of the deep bays on the coast of Norway and other Arctic countries the water often begins to freeze at the bottom before it does at the surface.

At the same depth (3500 feet) waves are not felt. Waves do not travel, that is, the water does not move forward, although it seems to do so; it remains stationary. It is the rising and falling that moves on.

The pressure of the water increases rapidly with the depth. At a distance of one mile the pressure is reckoned as about one ton to the square inch, or more than 133 times the pressure of the atmosphere.

To get correct soundings in deep water is difficult. The best invention for the purpose is a shot weighing about 30 pounds which carries down a line. Through the shot or "sinker" a hole is drilled, and through the hole is passed a rod of iron, which moves easily back and forth.

At the end of the bar a cup is dug out, the inside being coated with lard. The bar is made fast to the line, a sling holding the shot in position. When the bar, which extends below the shot, touches the bottom, the sling unhooks and the shot slides downward and drives the lard-coated cup into the sand at the bottom. In that way the character of the ocean's floor is determined.

If the surface of the Atlantic were lowered 6,554 feet it would be reduced exactly half its present width. If the Mediterranean were lowered 660 Italy would be joined to Africa, and three separate seas would remain.—*St. Louis Republic*.

Osoeola District.

Prospects are brightening at Osoeola District, out in White Pine county, and indications are good for a prosperous season. The deep snow will afford an abundance of water for the placers. At present there is no work going on in the quartz lodes, but there soon will be. The Cumberland Osoeola group, now owned by a Boston syndicate, will start up within the next 30 days. They will sink a shaft and run a tunnel and do general development work on the Cumberland, which has a shaft down 100 feet and a tunnel in 80 feet, and has been opened at other points on the eight-foot vein, which has four feet of pay ore, consisting of white honeycombed quartz, which will average about \$28 in free gold. The Osoeola mine, belonging to the group, is one mile away, and has a vein three feet wide that runs \$22 in gold. It has a shaft down 80 feet, and drifts have been started both ways; then there is a good stop above. This vein has been stripped on the surface a distance of 600 feet. The Royal Flush has a shaft down 160 feet, with 18 inches of ore at the bottom that mills \$30 in gold. The Revenue has a vein two feet wide, on which a shaft has gone down 20 feet. This ore is still better, running from \$30 to \$45 per ton. These four claims owned by the Boston syndicate promise to develop into a very big gold property. It is only lately that they were purchased from Doff Brown by the Raddatz Brothers and then sold to the Boston men, who have fully paid for them.

It is related of a run that was made in one of the bare this spring, where in a space of 80 feet long, 12 feet wide and an average of eight feet deep, Boone Tillford took out \$2500 in gold. He now has six or eight men in his mine and some others are at work, and all expect big pay this season. The Osoeola Gravel Mining Company is handling a large amount of gravel this season, and will make a big cleanup in gold.—*Reno Gazette*.

FISH IN DEEP WATER.—Divers in the clear waters of the tropical seas find that fish of different colors, when frightened, do not dart in the same direction, but that each different kind takes shelter in that portion of the submarine growth nearest in color to that of the fish.

Electric Power for Pumping.

The Amador Ledger says: On Monday we paid a visit to the property, now the foremost mine in the northern section of the county. We went more particularly to look at the electric pumping machinery recently put in, so as to be able to give an intelligent report of the same. The Gover was shut down some 15 years ago, on account mainly of being unable to control the immense flow of water encountered. It had reached a depth of 900 feet, with plenty of pay rock in reserve. A stream of water of 40 miners' inches was encountered, which defied all known methods to handle with any prospect of successfully operating the mine, so the property was brought to a standstill. It remained idle for nine or ten years, until Jonas Call, the present superintendent, took hold of it with other prominent stockholders, determined to place it on a paying basis if possible. The shaft was full of water to within 80 feet of the surface. They tried various methods of controlling the water. A 600-gallon tank was used for a time, but this was unable to cope with the abundant water. A steam-pump was put in, and this consumed six cords of wood per day, and this would not pay. With these devices the mine has run along for several years, but they have never been able to drain the shaft and work the 900 level, where the best ore was said to be located.

Finally they entered into a contract with the Edison Electric Company for an electric pumping plant with a capacity of 250,000 gallons per day, to be erected at the expense of the company at a cost of \$500, the Electric Company guaranteeing to run the same for a period of 60 days, at its own cost, as a test to show that the plan is practicable. The company also guaranteed to keep the plant in repair at a cost of not to exceed \$200 per year.

Some trouble was encountered at the outset owing to inexperienced and incompetent workmen being sent up to erect the machinery. The difficulty was with the motors in the shaft. Water and dampness affects electrical apparatus injuriously, and owing to imperfect measures to avoid this danger one or two armatures were burned out. As soon as perfect insulation was secured, the machinery worked like a charm, and has fully come up to the standard claimed for it.

The plant consists of the dynamo of 40-horse power, located near the mill, a quarter of a mile from the shaft, operated by water by a Pelton wheel under a pressure of 340 feet. The Pelton wheel makes 430 revolutions per minute; the armature of the dynamo making 920 revolutions per minute. From the dynamo the power is transmitted by means of two copper wires to two motors and pumping apparatus underground, one at the 300 foot level, the other at the depth of 600 feet. The reason why two pumps were placed in this manner was, that they have two large bodies of water to contend with, one at each of the levels named, and besides, if one pump should get out of order, the other can be kept going. While we were there, a steady stream of 13 inches of water was being pumped out of the shaft, without any trouble whatever. The 60 days' test expires this week, and the company is fully satisfied with the performance. In this time the shaft has been drained to the bottom, and to keep the mine clear requires the electric pump to be kept in motion only four hours daily. It takes 60 inches of water to run the dynamo and pumps. This for four hours daily would make an average of 10 inches every 24 hours, which at 20 cents per inch makes a cost of \$2 per day for controlling the water. To this must be added wages for man at dynamo and pumps while the same are running—say \$3 per day. The total cost would then be \$5 per day. Under the steam-pump system it cost between \$20 and \$30 a day for wood alone.

That power can be transmitted by electricity cheaper than by any other known method is clearly demonstrated here. A Cornish pump takes four inches of water for every inch discharged; the Edison company guarantee to use only 3½ inches for every inch pumped out.

An immense saving is also made in the size of the shaft. To operate Cornish pump or water tank requires a compartment shaft 5x4 feet for that purpose, with heavy timbering; also vast excavation underground to accommodate the cumbersome machinery. With electricity, all this is dispensed with. Room for two small wires and the discharge pipe is all that is required.

The 40-horse power dynamo delivers fully 35-horse power at the pumps underground. It is claimed that by compressed air or any other method of transmission less than 30-horse power would be available under the same conditions.

The machinery is harmless. If a person came in contact with the wires and received the full power of the current, he would receive no serious injury. It is easily handled, requires no expert to manage it, and altogether is one of the finest pieces of machinery we have ever seen.

We were taken all through the mine and mill, and every detail was explained to us by Mr. Call Sr. and his son A. B. Call. This is the first application of electrical energy to pumping underground, and as the question is of vital moment to the mines of Amador county and elsewhere, these gentlemen are

anxious to let mining men generally know the vast superiority of this method over all others so far as tried. The length of this article compels us to reserve our remarks on the operation of mine and mill until next issue.

About Mineral Land Claims.

Henry Marlon and others, who hold mining claims on the lower part of Shasta river, Cal., wrote to the commissioner of the land office at Washington, some time ago, in reference to the matter of railroad selections on mineral land, and received the following answer, which explains to some extent the position held by the commissioner concerning the locality named, which may be considered as having similar tendency to other sections of similar character:

I am in receipt of your letter of March 13, 1891. In reply I have to state the records of this office show that Twp 40 N. R 7 W. M D M. is within the grant to the Oregon division of O. P. R. R. Co., and that the odd sections therein were withdrawn September 6, 1871.

It does not appear that the R. R. Co. has applied to make any selection in either sections 16 or 25 of said township. It does not appear that any application for patents to mining claims have been filed for land in either of said sections.

Prior to the selection of land in either of these sections the miners are at liberty to locate and make application for their mining claims, and upon the submission of satisfactory evidence they will be entitled to receive patents for the same.

Land in said sections having been returned as agricultural land, the R. R. Co. will not be required to give notice of its application to make selections, but should you learn that the company has made such application, you will be allowed to contest the same as to such tracts as you may claim as mineral land.

Prior to the application by the R. R. Co. to make selections, or prior to the filing of applications for patents under the mineral land laws, this office will not order any steps to be taken with a view to segregating the mineral land in said sections.

It follows, of course, if you proceed to make applications for patents for your mining claims, and it is necessary to have them surveyed, it will devolve upon you to have such necessary surveys made at your own expense.

If your mining claims are "placers," it may be necessary to have an additional survey made, as they may be applied for by legal subdivisions in accordance with the public land surveys.

Very respectfully,
T. H. CARTER.

Washington Iron.

The Tacoma Ledger, says: Sometime ago in a general meeting of the Chamber of Commerce a committee consisting of A. J. Hayward, J. D. Coughran and Henry Drum was appointed to investigate the entire subject of the iron resources of Washington and report at the chamber.

The committee has met several times and has determined to make a personal examination of the Ellensburg and Cle-Elum iron. They will start for Ellensburg this morning for that purpose, and will remain so long as is necessary to thoroughly investigate the subject. It is understood that the Ellensburg Improvement Co., has a considerable sum for the development of their iron industries, and that if about \$50,000 additional could be secured, enough means would be had to put in a blast furnace and smelter. The committee will find out if enough varieties of ore are obtainable around Ellensburg to make good pig, and if fuel and lime can be obtained cheaply enough in that region to make blasting and smelting profitable. It is not necessary, in their view, that the works should be located in this city, as the manufacturing would come to Tacoma, in case pig iron could be brought here at low rates.

"Both Cle-Elum and Ellensburg have made considerable boast of being in fine iron regions," said Secretary Snowden of the Chamber of Commerce. "If it shall be demonstrated that these boasts are founded on hard facts, the Chamber of Commerce will see what arrangements can be made for the joint development by Ellensburg and Tacoma of their iron resources; but if they shall not have as much as is expected, then other parts of the State will be investigated."

The committee will be accompanied by Ed A. McCormick, a practical iron man of long experience in Pittsburgh.

THE PUBLIC DOMAIN.—It is telegraphed from Washington that Commissioner Carter, the new head of the General Land Office, is accomplishing wonders in the way of issuing land patents, and the settlers on the public domain throughout the great West will before long discover that the new Commissioner, coming as he does from one of the new States, fully understands their wants, and sympathizes with their efforts to get titles to the lands they have entered upon for homesteads. Yesterday there were issued from the General Land Office a total of 736 patents, and the day before there were 2000. This is an unprecedented number for two days, almost as many as were issued during the entire period of the last administration. It is expected at the present rate of progress the General Land Office will speedily catch up with its work.

Natural Gas at Stockton.

Under the heading of "Natural Gas for Power," the Independent contained an editorial article on the advantages of natural gas to Stockton, its supply, etc., which is the main was correct. It contained a few errors, however, as the information for the article evidently was obtained by observation by the writer of gas enterprises here and from local alleged gas experts.

The writer speaks of Stockton gas as "water gas," and that of the East as "dry gas," as though they were two different elements and derived from different sources. That is a mistake, says the Stockton Record. The gas strata underlying this city is the same as that underlying the Eastern gas districts; the Trenton rock which overlies the porous gas-bearing rock in the East is found here overlying the same kind of porous rock carrying "dry gas," just the same as in the East. But when that dry gas strikes the water, of course it becomes "water gas."

The Independent falls into the error of asserting that the sinking of gas-wells here is less expensive than in the East. The contrary is the case. In the great dry-gas districts of Ohio, the average depth of the wells is less than 1400 feet, though one at Toledo is 3500 feet. But at Findlay, only 25 miles south, and for a distance of 40 miles in all directions from that place, the wells are but 1200 and 1300 feet deep. There is no artesian water to contend with, neither is there any quicksand. First, a strata of limestone rock is encountered, and then gravel-beds and clay until the Trenton rock is struck. Here the casing is stopped, and the water shut off, when boring proceeds dry. When the gas-bearing rock has been penetrated about 30 feet, a dynamite cartridge of 60 or 100 pounds is exploded in the bottom of the well, and the flow of gas by this means is in some instances more than doubled, and instead of being measured as here by thousands of feet, it is done by millions. None but sore casing—water-tight—is used.

When the gas-bearing rock in that region is passed through, salt-water is encountered, the same as here, and the well is either filled up to the gas strata or abandoned, as the salt water destroys the gas.

In none of our gas-wells has the flow been increased by depth of boring, after the gas-bearing rock has been passed, neither will it ever be done, unless another strata of gas-bearing rock is encountered.

All the gas was originally in the porous formation beneath the Trenton rock, and when that rock is once passed and salt water flows up the pipe, the well is injured. The gas which is found in the first strata of artesian water is always weak, as it has been forced up through seams in the rock to that position, and as boring progresses, each successive stream of water contains more gas, until the porous rock where the principal supply is found is penetrated.

Exactly the same conditions obtain in the Eastern gas fields, only they have no artesian water or quicksand to contend against.

That there is a heavy pressure of gas beneath the surface in this city is evidenced by the fact that it is forced up into all the streams of water for hundreds of feet above, and when the time comes that a company of capitalists take hold of the matter, and go to work in the right way from the start, gas will be led up to the surface in its dry state, and instead of being neutralized or destroyed by contact with salt water, its full force will be made available in a supply similar in magnitude to that of Eastern wells, and the Record predicts that within the coming year the experiment of shutting off the water and testing the gas-bearing strata in its natural dry form will be made with the happiest of results.

A New Enterprise.

For sometime work has been prosecuted in the neighborhood of Chili Bar, having for its object the establishment of an electric plant for the distribution and sale of electricity for power and illumination. The Pearson Bros., William and John of this city are at the head of this enterprise. Others may be connected with the business, but if so, their names have not been made public. These gentlemen have taken up a water right on the American River some distance above the Chili Bar bridge. From this point it is their intention to construct a large flume and ditch to a point near the mouth of Kelsey Canyon, a distance of about one and one-fourth miles. At the latter point they expect to locate either a turbine or an undershot water wheel to operate a dynamo. It is calculated that they will have a pressure of 40 feet and that with the head of water they can obtain, they will be able to generate 400 horse power.

A survey of the ground has been completed and seven or eight men are now employed in grading for the flume.

An order for 200,000 feet of lumber has been placed with J. & J. Blair to construct this flume, into which the water will be diverted by a wlog dam in the river.

It is believed that the work can be completed and the machinery placed by the beginning of next winter, or at least not later than the opening of the new year. Lines will then be ex-

tended to this city and to other points where there may be a demand for electric power or lights.—El Dorado Republican.

Lassen Irrigation.

In the record of the progress of irrigation development, one portion of the State has not received the attention to which it is justly entitled. The locality referred to is Lassen county, and an idea of the extent of the irrigation enterprises of that section may be gathered from the fact that within three years no less than 18 storage reservoirs of large size have been built for the purpose of supplying water for the cultivation of the large bodies of arid, but exceedingly fertile lands of that county.

Another project of the same sort is now under way, which, when completed, will rank among the foremost in the State. The location of this new enterprise is in the Honey Lake valley, and from the report of L. H. Taylor of Sacramento, the engineer in charge of the work, the following interesting facts are learned:

The source of supply is Long Valley creek, which has a drainage area of over 400 square miles in the Sierra Nevada mountains. About six miles above the mouth of the creek, there is a narrow canyon through which the stream flows, and here it is proposed to construct a dam. This will be of earth, with a puddled core, and will have a thickness at the base of 443 feet, sloping gradually at the same angle on both sides to the top, where it will be 20 feet thick. The extreme height of the dam will be 94 feet. At the base, in the bottom of the canyon, it will be 200 feet long, at a height of 85 feet the length will be 740 feet, and at the full height the length will be 900 feet.

A reservoir with an area of 1000 acres will thus be constructed which will have an average depth of water of 31 feet. This will give an available supply of 1,350,000,000 cubic feet, or 10,125,000,000 gallons of water, or considerably more than the famous Bear Valley reservoir. That the source of supply for this reservoir will be ample may be seen from the fact that measurements taken by the stream show a flow of 1600 to 15,000 miners' inches, while the greatest evaporation noted has been but two inches a month in similarly situated reservoirs in the same county.

The water will be conveyed from the reservoir in open canals to the lands which it is proposed to irrigate, and which comprise a large area of fertile soil. The reservoir will have a capacity to supply 100,000 acres, but it will be some time, of course, before so large an area will be put under cultivation. The entire cost of the dam and the diverting canals, however, will not exceed \$100,000, from which it will be seen that this is one of the cheapest irrigation enterprises in the State.

The lands that are to be irrigated from this reservoir lie at an elevation of 4000 feet, and are as fertile as any in the State. They all require irrigation for cereals, grasses, fruit and ordinary farm crops, but the results are most remarkable. From 35 to 45 bushels of wheat and from 45 to 80 bushels of barley are the average crops, and the grain is of the finest quality. Alfalfa is a favorite crop, this being a splendid stock-growing section, while the potatoes produced here are superior to even the famed Salt Lake product. For apples and similar hardy fruits no better location exists. The pioneer apple-growers of Honey Lake valley enjoy profits that equal those secured by the citrus fruit producers of the South. This valley is destined to take high rank for its apples, pears, cherries, plums, etc.

A good commencement has already been made in actual work on the dam, and it is expected that by next season the reservoir will be completed and water will be supplied.

Not the least of the advantages of the Honey Lake valley is the fact that it is already traversed by a railroad (narrow gauge) running north from Reno. The present terminus is Amadee, 85 miles north of the starting point, but the line has been surveyed through to Oregon, and it will undoubtedly be pushed to completion, thus giving the many fertile valleys of Lassen county an outlet for their farm products in two directions.—Chronicle.

Cleaning Gold Off Copper Plates.

Take the plates and put them over a red charcoal, coal or coke fire, and evaporate the quicksilver off them slowly. (If the fireplace of a spare boiler is large enough to admit the plates, the best plan is to make a thin red fire there and use it.) After all the quicksilver is evaporated, the plates should be taken out and allowed to cool. They should now be rubbed over with muriatic acid, and put in a damp place all night. The next process is to rub them over with a strong solution, made with equal parts of salammoniac and saltpeter, and again placed over a red fire and heated slowly, care being taken not to allow them to get red hot. When the proper heat is got on them, the gold scale will rise in blisters; when this takes place, the plates should be taken off the fire, and the gold scraped off. Another way, if a trough is available (wider than the plates), is to fill it half full of water, and when the plates are taken out, dip them in the water, when the gold will scale off. If there should be any part

of the plate on which the gold has not risen, these parts should be again rubbed over with the solution and again fired. If these directions are properly carried out, the gold will be completely taken off the plates.

After the gold scales are collected, they should be put in an earthenware dish and covered with nitric acid until all the copper is dissolved; when this is done, the gold can be smelted in the usual way, but corrosive sublimate should be put in the crucible (after the gold is melted) until there is no more blue flame given off.

A Lixiviation Plant.

NUMBER III.—CONCLUDED.

[Read by C. A. STETTER, San Francisco, before the American Institute of Mining Engineers.]

10. Auxiliary Machinery.

Air Compressors.—For Montejus or geyser-pumps and for the press-tank, two separate air-compressors are needed, the one furnishing air of about 30 pounds, the other of 150 pounds pressure. The size of the compressors must be calculated to meet the demands of the capacity of the works. The Montejus air-compressor should have a capacity to raise all the stock-solution needed per day in about eight hours, so that the plant is not in operation all the time and the solution can be transferred quickly.

Sulphide-Sampler.—The breaking-up of the lumps of sulphides and other precipitates, as they come from the drying-chamber, is done in an ordinary small sample-grinder, as sold by any western foundry.

Boilers.—If considerable steam is needed for heating the stock solution and wash water prior to its precipitation by scrap-iron; also for running Koerting ejectors and vacuum pumps a separate boiler is desirable for the lixiviation-plant proper.

Fire Pumps for Sluicing Tailings.—If the water in the pipe-line has not sufficient head for sluicing tailings, a fire-pump for this purpose becomes necessary. A steam-pump of the Keweenaw type may be used with 10-inch steam and 5-inch water-cylinder, 12-inch stroke and 4-inch suction and discharge. But I would recommend a Koerting steam-jet fire-pump, which is much cheaper than a plunger-pump and not less efficient.

11. Pipe-Line.

Iron gas-pipes are used for conveying stock-solution and sodium sulphide solution.

They should be joined by flange-couplings. The size of the stock-solution-pipes above the ore-tanks depends on the capacity of the works, and the position of the storage-tanks, producing more or less head. In large works they are generally taken from three to four inches in diameter.

12. Cocks.

The only cocks resisting for a long time the corroding action of lixiviation-solutions are the Pett-Cady iron-body, Bower-Barffed plugs, sheet-steel cocks, sold by Fairbanks & Co., New York. These cocks last very well, even on the sodium-sulphide mixing-tank. They were first introduced in lixiviation-works by the writer at the Marsac Mill, Park City, Utah.

13. Protection of Iron by Asphaltic Covering, and other Notes on Construction.

Castings and Pipes.—Castings and pipes exposed to hyposulphite solutions must be protected by an asphaltic covering; the pipes, of course, on the inside. Pipes conveying sodium sulphide solution do not require such covering. A pure asphalt, called "Maltha," manufactured in San Francisco, the residue from distillation of heavy California mineral oils, now shipped in considerable quantities to the eastern States, is exceedingly well adapted to this purpose. The maltha is melted in a sheet-iron trough, and the clean and dry castings or pipes are immersed in the bath. They should remain there until the iron has reached the temperature of the liquid asphalt; this insures firm adhesion of the asphaltic covering to the iron. The propeller-screws and shafts for the precipitating-tanks are covered in the same way.

Montejus tanks and the press-tanks need different treatment. Here a malthine varnish is used. To the clean and dry inside of the vessels, a coat of varnish is applied. After drying, a second coat is put on, and, as the painting progresses, cotton cloth—weight about six ounces per yard—is pasted on, care being taken to saturate overlapping joints with varnish. On the top of the tank the cloth is drawn over the flange. The cover is treated in the same way. Finally, a third coat of varnish is put over the cotton cloth. After perfect drying, the cover is hoisted on, using a soft rope saturated with varnish for a gasket.

Fastening Castings and Flanges to Tanks by Bolts.—Bore holes to fit bolts close; counter-sink bolt-heads into wood and cover with thick white lead. Washers behind bolt-heads are also laded in white lead. Bolts are first covered with asphalt.

Connecting Rubber Hose with Gas-Pipe Nipples.—The following method was communicated to me by F. M. Johnson: Draw out the nipple to fit the inside of the hose closely; heat the nipple so that it will melt rubber without burning it; then press the nipple into the hose about four inches and immerse immediately in asphalt varnish for cooling. The hose adheres so firmly to the iron that it can only be removed by cutting.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GOVER.—Amador Ledger, June 27: This mine is in a more prosperous condition than at any time in its history. Last week we were taken all through the mine and mill. Everything above and below ground is a model of convenience, showing that it is ably handled with a view of securing the best possible results. The shaft is 900 feet deep. The ore that supplies the mill is taken from two levels, one at 300 and the other 600 feet deep. At the 300 level a drift has been run north 200 feet, showing a ledge 20 feet wide. At the 600 level the drift runs south 600 feet, in ore all the way, the ledge being fully 20 feet wide at the face. The rock is of low grade, taken as a whole. Occasionally some very rich seams are encountered, but the average yield is between \$5 and \$6 per ton, including sulphurets. This is fully up to the average of pay rock on the main belt, and leaves a fair margin of profit after paying all running expenses. The best ore is believed to exist below the levels now being worked, and with the efficient machinery for controlling the water, the 900 level will soon be opened up, from which big returns are expected. The 20-stamp mill is kept running steadily, crushing about 60 tons per day, or three tons per stamp. Probably in no place in the county is the gold-saving business brought to such a high degree of efficiency as at the Gover mill. The stamps are 900 pounds each; only steel shoes and dies are used. It is run by water power under 365 feet of pressure, taking 50 inches to run the mill. The concentrators are of the Woodbury patent—one concentrator handling the tailings from a five-stamp battery. An independent water-wheel is used to run the concentrators, thereby securing a uniform motion, which is an important point in concentrations. These Woodbury machines have given excellent satisfaction. After leaving the mill the tailings are run over a large area of canvas, where considerable sulphurets are caught. Passing this the tailings are run into a number of wooden tanks, where they are allowed to settle, and these settlements are finally run over a Woodbury concentrator, which also captures the fine sulphurets. After getting through this formidable gauntlet of appliances, the tailings assay only 50 cents per ton. It is believed that even this small loss can be further reduced by adding other settling tanks. The mill yields about 60 tons of sulphurets per month, which run from \$90 to \$100 per ton. The mine and mill give employment to 50 men.

BELMONT.—The superintendent reports for the week as follows: Tunnel No. 1 has been advanced eight feet; total distance 350 feet. The usual amount of ore is being milled from stopes above tunnel level. Plates in mill are yielding well.

MISCELLANEOUS.—Reports from the Hardenberg are to the effect that the ore so far crushed while low grade, is equal to paying all working expenses, and leaving a small profit besides. It is proposed to sink another 100 feet and see what character of ore exists at that depth. The ro-stamp mill is kept running steadily.

El Dorado.

GOOD REPORTS.—Georgetown Gazette, June 27: Good reports reach us from the Schultz mine on Coloma hill. The vein is narrow but bears rich in gold. A San Francisco firm has ordered 150 tons of yellow chrome from Pilot Hill, and it is now being hauled to Auburn. Armstrong & Ritchie are doing slow but sure work on their mine north of town. They have a big ledge easily worked. It is opened in five places on the side of the mountain and can furnish ore by the quantity for any sized mill. The Ambrose & Martin mine, recently handed over to W. S. Lyle of San Francisco, is being prospected by tunnel. W. Gibbs, who has the contract, reports the ore increasing rapidly, and in a few days expects to see the one-foot vein matter on which he began, to cover entire face of tunnel. It is now over three feet and assays up in the hundreds. The Ben Franklin mine, 2½ miles south of town, has been freed from water, and a drift on south line of ledge at 80-foot level will now begin. The open cut in gulch 200 feet on north line of ledge shows, by estimated pan tests, \$18 per ton. Mr. Dent, the owner, has been erecting houses for the convenience of the miners, and also preparing for hoisting and pumping works soon to be erected.

THE VAN MINE, near town, is idle, prolific only in lawsuits between owners. It is a pity their difficulties can not be reconciled. It is certainly one of the best mines in the county. The report we made of this mine last winter from personal investigation as a miner, when the 32-foot crosscut was made and which was widely copied by the press, is substantially correct, and it will not be long before our report will be vindicated by the successful operation of the Van on a large scale.

Inyo.

SYLVANIA.—Inyo Register, June 26: A representative of this paper paid a flying visit last week to several camps east of the White mountains. At Sylvania affairs remain in statu quo so far as the business of the Sylvania Co. are concerned. No work is being done in the company's mines, or in connection therewith. A fine new furnace stands there ready for firing up, and several hundred tons of good smelting ore, belonging to the company and others, lie on the dumps ready for working, but until certain liabilities are settled, nothing can or will be done in that direction. N. Beaudry & Co. are taking out some very fine ore from a mine of their own located about a mile east of the furnace, and expect soon to ship a carload to the Selby works. This ore assays about \$600 in silver, and over \$300 in gold. W. S. Kincaid will soon ship a carload of ore assaying as high as \$400 per ton, from a mine he has recently opened, known as the Kincaid, and situated about two miles westerly from the camp. This, as well as the one previously spoken of, are quite valuable prospects. Frank Buser and his son, John, continue to work away on their old-time properties. They have out and in sight many tons of ore that would certainly pay quite well to work in the camp, but except after tedious sorting, not rich enough for shipping. It is galena in part, but mostly a carbonate lead ore, running about \$50 per ton. It is confidently asserted by others than the owners that the Buser mines alone

could supply ore enough of about that value to keep the furnace running straight along.

TULE CANYON.—Some 15 miles easterly is quite a lively camp. Some 25 miners, including a number of Chinamen, find employment there, mostly in gold placer mining. Big chunks of gold are occasionally found, but the average yield of the placers rarely amounts to more than ordinary wages. The ore from the quartz ledges is unusually rich but not large in quantity. The writer did not visit that camp. Farther up this Cottonwood creek, Sam Piper and others are operating some small gold ledges, and working the ore in this water-power arastra, making grub, but not getting dangerously rich as an average for the year though. Farther up the same stream O. K. Barry, who has put in some 20 years in that locality, continues to work away on his silver ledges, but with no strikes of importance to chronicle, although in hopes as great as ever. Some new parties are about to buy some extensive testing operations on several of the gold ledges in the vicinity, and expect to use the Greenly five-stamp mill for that purpose.

DEEP SPRING VALLEY.—Nathan Gilbert has men at work on the historical old Cinderella mine, and feels highly encouraged with recent developments. The Paysons, at Antelope Springs, are getting out some splendid silver lead ore from a new location by George Payson, and expect soon to ship a carload. Nearby is a very large ledge, said to carry a high percentage of bismuth and gold telluride ore. Antonio S. Cunha is a principal owner in this ledge, and has been operating on it for two or three years, but owing to the peculiar character of the ores, has realized nothing as yet for his labor. From all accounts, this is a property some expert might do well to investigate.

BIG PINE.—Cor. Inyo Index, June 27: The steady and regular interest in the mineral resources of the several belts outlying Big Pine received a lift last week by the appearance of a huge kidney of ore from the claim of Droillard & Broder. The lump weighs 168 pounds and is said by the owners to be just a fair sample of the carload sent out on the northbound train yesterday. The works to which it was shipped allow a price which leaves the shippers a safe margin of profit. From an interview with Scott Broder I am convinced that they have certain indications of capacity and permanency, which assure these long-time prospectors of being the possessors of a valuable claim. It is located only about 14 miles from Big Pine, in an easterly direction, and has been known at the Bay in mining circles as the Scott mine.

Nevada.

THE CENTENNIAL.—Transcript, 25: Superintendent Richards writes to the Centennial Co.'s office that he has the new tunnel in over 1000 feet. The face is in hard, tough bed-rock which works well and needs no timbering. This tunnel must eventually—a few hundred feet further on—cut into the rich gravel channel already developed by the San Jose Co. adjoining. Meanwhile, 20 feet further ahead from the present face or end of the tunnel he will make another upraise to the gravel bed, recently found by the two upraises a few feet above the tunnel, 100 feet apart, showing the gravel to be 100 feet wide. The new crosscut was expected to show an additional 100 feet. It is pay gravel, and its washing is to be commenced as soon as practicable.

COLUMBIA HILL.—Nevada Transcript, June 27: In the locality adjacent to Columbia Hill, quartz mining has never before been so extensively carried on and with such encouraging results as is the case this year. In fact, until within a comparatively recent period gravel mining was the only branch of the gold-getting industry that prevailed there to an extent that attracted attention. At the Delhi, which is the pioneer quartz enterprise of any considerable magnitude, the No. 4 tunnel, which has a depth of 800 feet, is in 1600 feet and shows in its face a three-foot ledge of splendid milling ore. A wize that is being put down from the No. 3 level produces \$40 ore. Eighteen stamps are crushing daily and good profits are realized. Seventeen men are employed and the force will be increased as the opening up of the property progresses. At the St. Gothard, 600 feet east of the Delhi, 24 men are working. The new steam hoisting and pumping machinery was started up yesterday for the first time and moved satisfactorily. The fine new shaft is completed to the drain tunnel, which is 180 feet below the surface at that point. The shaft is timbered all the way down. It is to be sunk as fast as possible to a depth of 600 feet, and will cut the ledge (which varies from one to four feet in thickness and is of paying quality) at a depth of about 400 feet. Some of the ore taken out through the drain tunnel has been milled and gave highly satisfactory returns. At the Enterprise, 600 feet west of Delhi the tunnel is in 430 feet and shows in its face a five-foot ledge which has just been struck. This was a "blind" ledge, and its discovery was a pleasant surprise to the stockholders. Some very rich specimen ore has been taken from it. An air blast is now being constructed, the water being obtained from the Delhi ditch. Six men are working at the Enterprise.

DISCHARGE OF MINERS.—Grass Valley Union, June 23:—Sixty miners were dropped from the pay roll of the Empire mine on Saturday. This was done because of the poor quality of the ore now showing in the mine. Nearly all of these men, however, will remain at the mine and take out quartz on tribute. There is plenty of low-grade ore opened up, but it is not rich enough to pay the regular wages for mining it. Under the new arrangement the full head of 40 stamps will still be kept going. The Empire mine has its poor streaks at times, but never fails to come around all right in the end. This has been the history of its life, but first and last it has yielded an immense amount of gold, and is also celebrated in having been worked for a longer period continuously than any mine in the State. More new ground is to be opened by the sinking of the No. 20 level as speedily as possible.

Shasta.

BULLION.—Shasta Democrat, June 27: We hear that the bullion shipment from the Brown Bear mine at Deadwood last month was \$52,000, the largest monthly output from any one mine in this part of the State we have heard of. The present owners of this great mine purchased it from Grason for \$20,000 after he thought he had worked it out with Chinamen. Since it got into the hands of the present owners—some 12 or 14 years ago—it has

paid large dividends every month, and is now as good or a better mine than it ever was. The Yellowstone mine on East Fork, Trinity Co., was closed down a week or more ago and a large number of men are thrown out of employment.

Siskiyou

QUARTZ AND GRAVEL.—Yreka Journal, June 24: Doc Luttrell has lately discovered a couple of quartz ledges on Indian creek, one of which called the Mammoth, prospects exceedingly good. He has also taken up a good claim on Paterson creek. Doc is an old pioneer of Scott Valley, but has been residing for many years past in Oakland. He has always felt confident of being able to find rich mines in Siskiyou, and returned about a month ago to try his luck. Fred Kols, who struck rich prospects in his bank claim on Klamath river, near Oak Bar, was obliged to stop work last week on account of the pit filling up with water, by the recent rain storms raising the river to flood the diggings. He will soon have the pit pumped out again to resume operations. Lee, Lash & Co., of the Greenhorn blue gravel mine shut down operations last week in hoisting, but are now opening a new shaft near the stage road, or rather continuing an old abandoned shaft were Pipes and others tried to reach bed rock several years ago, but were prevented by water. The hoisting machinery and steam pump will be moved to this shaft, and when the blue gravel is reached, the company will drift up toward their other shaft where the cave occurred a few weeks ago. The Yreka Blue Gravel M. Co., placed a night shift at work in the shaft last Wednesday, and the work of sinking down to strike blue gravel is now progressing day and night. The shaft is down about 24 feet, and water has been reached, requiring the use of gum boots and bailing out, with intention of using a good pump as soon as necessary. The latest report from the Yreka blue gravel mine is that blue gravel was found yesterday, at a depth of 24 feet, which is very hard to dig through, and prospects very good. Before reaching the blue gravel, a body of shale was found indicative of coal, and it is probable that coal can also be found in the country surrounding Yreka basin. The Coal M. Co. known as the Hornbrook syndicate, comprising J. L. Coyle, David Horn and M. G. Burkhalter of Hornbrook, and B. D. Wilkinson, R. R. agent of Montague, including Wise and his partner, formerly working the Willow Creek coal mine, bonded the property last week from Mrs. Wise for the sum of \$7,500, with 18 months time to pay the amount and secure complete possession. This company intend commencing work on an extensive scale in developing the immense coal bed in sight, and will no doubt realize a fortune, as the coal now taken out is said to be of better quality than that used on the S. P. engines brought from below. The coal will bring good prices in this county, as the freight from below makes coal from seaboard too expensive, and as firewood within easy hauling distance of the various towns, especially Yreka, is becoming very scarce, the use of coal will eventually succeed wood if furnished at equal or less cost.

SALMON RIVER.—Siskiyou Telegram, June 27: R. L. Fogundez of Salmon river was in the city for a couple of days last week. He is one of the prosperous miners of his section, and while in S. F. purchased a complete quartz-mill outfit of five stamps to replace the arastra he had heretofore used. He informed the Telegram that, were it not for the great difficulty in transporting machinery over the mountains, many more would follow his example. The truth of this may be considered when it is said that it will cost Mr. Fogundez over \$200 to have the mill carried from Etna to Sawyer's Bar. Those people should have a wagon-road.

HENLEY GRAVEL MINES.—Siskiyou Telegram, June 20: Last Sunday we paid a visit to the thriving mining town of Henley, where we remained over night, returning to Yreka next day. While there we visited as many of the principal mines as our limited time would allow. The nearest enterprise of importance to the town of Henley, is that owned by Mr. A. Harvey, who is at present constructing an enormous reservoir over the old Brass Wire channel. This reservoir will be used for working some of the richest mining ground in the Cottonwood district, comprising several hundred acres. Mr. Harvey has already had an enormous amount of work done, but there yet remains much more to be completed before everything can be put in working order. This gentleman certainly has a very desirable piece of mining property. The next mine we visited is the celebrated Jillson mine, situated about two miles below Henley. Here we found Mr. Jillson, who very kindly volunteered to show us around the mine, and explained the several different formations of earth and stone, with which he is so thoroughly acquainted. This mine is well fitted up, having two large "giants" with which to tear up the gravel and bedrock, besides this, the mine has the best of natural advantages. Being located on a hill above the river, it has one of the finest dumping places in the world, and never can be handicapped by the accumulation of tailings and debris. Although Mr. Jillson was enabled to make but a short run this season, owing to the shortage of the water supply, it is confidently expected that the cleanup will exceed \$7000. At present operations in the main part of mine is suspended, and a small force is engaged in running a tunnel into the gravel, and have already attained a distance of about 150 feet. The only obstacle in the way of easy working is a good-sized strata of pipe-day. The gravel is of almost a sky-blue color, and although it is quite solid, is not too hard for successful working. On the opposite side of the river from the Jillson mine, is that owned by Capt. Wilbourne, who is also working in blue gravel, and is the happy possessor of a good mine. The Rummel mine, farther down the Klamath, we were unable to visit, but were informed by reliable parties, that since the mine has passed under the successful management of I. H. Hazlett it has commenced to yield good returns.

Trinity.

STRUCK IT RICH.—Journal, June 27: A letter from William Toms at New River informs us that they have struck the Ridgeway ledge and that it is very rich. We will probably receive full particulars for our next issue. We have always entertained a very friendly feeling for Messrs. Dean & Toms, and for their persistence and enterprise we think they deserve great credit and success.

Tuolumne.

CLAIMS LEASED.—Tuolumne Independent, June

27: Louis Page has leased the Ferguson, Simonich and Old Austrian claims at Brown's Flat and will run a tunnel 300 feet in length through them, starting in at the Fox claim near where the Austrian Bros. were drowned about five years ago. The tunnel is in 225 feet and Mr. Page expects to strike the vein within 75 feet, when he will follow it through the claims. For timbering he uses red fir, which he says is superior to any other wood for wet or dry ground. At the upper end of the claims the tunnel will be 700 feet below the surface. Many rich pockets have been found in these claims, and systematic work, by means of this tunnel, will doubtless develop many others.

NEVADA

Hawthorne District.

LAPANTA.—Walker Lake Bulletin, June 24: During the week the incline below the tunnel has been continued; formation very large; vein running flatter. Owing to this are obliged to run under the ore, and the iron is found to carry about \$45 in gold. Are stopping above the tunnel and extending the new drift, which is producing ore. In the raise above the east drift from No. 6 incline the chute of ore mentioned last week still continues and is getting larger. Last run of ore milled \$60 per ton.

PAMLICO.—Still extracting ore from the stopes at the north end of the mine. Main tunnel being driven ahead.

CENTRAL.—The 75-foot level is still being extended. Showing very well. Stopes above this level continue to yield the usual amount of ore.

MOUNTAIN KING.—Main tunnel still being extended. The face is now 55 feet beyond the first ledge. The face shows a strong body of talc and quartz, which is believed to be the footwall seam of main ledge.

HARTFORD.—Still sinking on the ledge, producing lead and gold ore; ledge showing strong in bottom.

BEACON.—The stopes from the incline still producing the usual amount of ore.

GOLD BAR.—The south drift, Martinez tunnel level, has been extended ten feet during the week. Ledge strong and producing very rich ore.

CONFIDENCE.—New incline down 37 feet on the vein. Ledge about 2½ feet wide. Quartz on hanging wall carrying silver. Formation softer and looking favorable for ore.

WAR EAGLE.—Stopes yielding usual quantity of good ore.

FAIRMOUNT.—During the week the principal work has been done in the stope above the drift, which still continues to show from five to six inches of 150-ounce ore, with bunches of 800-ounce ore in same, and in sinking incline below tunnel level it shows about four inches of 400 ounce ore.

CHALLENGE.—Still driving main tunnel ahead on the vein; same showing very well.

IDA.—Still producing the usual amount of ore, some of which is very high grade.

NEW YORK.—During the week tunnel has been extended 10 feet, intersecting the parallel vein, upon which a drift has been started to the south.

Morey District.

HIGH GRADE.—Blmont Courier, June 20: We learn from Samuel J. Robinson that Ernest Schendel has found a fine body of high grade ore in the Morey mine in Morey district, Nye Co. Forty or 50 tons of the ore has been taken out and is now on the dump. The value by daily assay is about \$700 per ton. The ore is from a point lower than that which was formerly worked, and required skill and perseverance to develop.

ARIZONA.

MOHAVE COUNTY.—Miner, June 27: It is understood that the Diamond Joe mine will soon be sold to a syndicate of Kingman capitalists. The Elkhart mine has already made a contract with Beebe to haul in 500 tons of ore immediately. Mr. Lawrence, of Ivanpah, was in town Tuesday with several tons of rich copper silver ore from his mine at that place. There are more prospectors out in the hills now than at any time for years past, and a great many good strikes are being reported. Another carload of Diamond Joe ore was worked at the sampler this week, and five or six carloads are in Hackberry awaiting shipment. The Chloride mines are being worked for all they are worth and are showing up well. In fact they are becoming the best producers in Arizona. Tom and James Mulligan are driving the main tunnel on the Big Bethel mine in under the mountain. The have a fine breast of ore in the face of the tunnel and are opening up a fine piece of stopping ground. James Penberthy and H. B. Cox were down from the American Flag mine Tuesday, and reported the mine looking well. They have considerable ore now on the dump which will soon be sorted up and sent down to the sampler. R. C. Hall has been in town this week from the new gold diggings in Death Valley, with several tons of gold ore which he sold to the sampler. The ore is of a good grade, but will not pay to haul such a long distance for treatment.

TOMBSTONE.—Prospector, June 25: If the property owners in Tombstone have not enough confidence in the mines of the district below water to put 10 percent of their holdings into a pumping proposition, how can they expect outsiders to do else than shake their heads and look wise when you talk to them on the question. The pay rolls of the mines of this camp do not show over 150 men at work and about \$20,000 dropped each month by the mining companies. In 1883 the pay rolls amounted to \$200,000 per month and another \$120,000 was dropped for mining supplies. This state of affairs can again be brought about by a little energy on the part of every one.

MOHAVE COUNTY.—Miner, June 20:—The Elkhart mine continues to ship ore to the sampler in carload lots. A great deal of lumber is being hauled to the mines on the west side of the Cerbat range these days. The shaft on the Mexican mine is down nearly 200 feet and the ledge in the bottom is looking fine. L. J. Lassell has gone to the Flores mine, and while there will survey a site for the new mill soon to be erected on that property. Merrill and Cary sent down a small lot of rich ore from the old Hackberry mine which they sold to the Kingman sampler Monday. Work is progressing on the gallow's frame and the hoist on the Ark mine and it will probably be in running order on or about the first of July. Sample and Jamieson have struck a

good streak of ore in the winze now being sunk to connect the upper with the lower tunnel in the Rip Van Winkle. Brawn's and Beebe's big ore teams are kept very busy hauling in the vast amounts of ore now lying on the dumps of the mines throughout Wallapai districts. Hon. P. F. Collins has gone back to the Champion mine. He expects the new tunnel now being driven into that property will cut the ledge about the first of August. Morgan Humphreys and Bob Rouse had a small lot of ore worked at the sampler last Saturday.

BRITISH COLUMBIA.

LOOKING BETTER.—*Miner*, June 20: Not satisfied with any of the offers made for their property, the owners of the Queen Victoria, a copper lead on the north side of the Kootenay, have been busy for the past few weeks doing more development work. The tunnel is now in about 35 feet, and is crosscutting the ledge. The ledge has been stripped in four or five places and is from 90 to 100 feet wide. The ore carries copper and silver, and is low grade. The face of the tunnel is now in the best mineral they have struck so far.

ASSAYS OVER THREE HUNDRED OUNCES.—Rover Creek district has evidently other good properties besides the gold claims. The Mayflower, a claim located there about a month ago by Messrs. Casp, Mulvey, McKee, and Gentile, has a vein of galena from eight to ten inches wide—galena, too, that assays \$378.60 in silver and 60 per cent lead. The owners have laid in supplies for the summer and are going to do development work.

THE SMELTER.—*Nelson Miner*, June 25: The smelter at Revelstoke will be blown in as soon as the ore now sacked at the Number One mine, in Hot Springs district, can be got through to Revelstoke. The owners of the smelter have at last arrived at the conclusion that if the smelter is to be run, the ore must come from the Lake country.

MINOR SALES.—A half interest in the Ivanhoe, the second easterly extension of the Iroquois, was purchased by R. G. Tatlow of Vancouver, and the whole of the Balok by Richard Ashworth of Billings, Montana, for \$500. The former claim is in Tread Mountain district, the latter in Hot Springs district.

A CLEANUP.—The hydraulic company operating on 49 creek made a first cleanup last week. It was quite satisfactory, although the ground worked had been gone over last fall. Another cleanup will be made on Monday.

SOLID GALENA.—A mining man who recently visited Goat River district says the Alice is a fine looking prospect, with a ledge carrying fully 30 inches of good galena ore. It is understood that its owners hold it at \$50,000.

DAKOTA.

A BOOMING CAMP.—*Deadwood Pioneer*, June 20: State Inspector of Mines Corkhill returned from Silverton, the new mining camp, yesterday morning. He says that Silverton is the liveliest camp he has seen for years. Fully 200 prospectors are in the camp and more arriving daily. They came from every camp and town in the Hills as well as from Colorado, Utah, Nevada, Idaho and Montana. Claims are being staked in every direction, and the development in the Spokane warrants the excitement. The owners, Messrs. Juds, Schaler and Wright have eight teams hauling ore to the railroad for shipment. The ore is black sulphurets of silver and found in a true fissure. Its value is known only to the owners, but all old silver miners will recognize its worth. The same is found on two other claims, presumably extensions of the Spokane. A number of B. & M. officials and representatives are in the camp looking it over and getting interests where they can. The camp is on Battle creek, 10 miles from Hermosa, on the Elkhorn, and 14 from Hill City, on the B. & M. The route for a railroad is practical and easy of construction from either point. The most peculiar feature is that the Spokane ledge is paralleled by a rich ledge of tin ore. The present owners located the claim in the latter part of '90 or January '91 and immediately began work. No sooner had they found ore in paying quantities than Buckingham & Johnson, presumably in the employ of the Harney Peak Co., claimed to have located it and posted notices in '89 and again in '90, but no records of the fact can be found, neither are there any evidences of the necessary amount of work being done to make even a location valid.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, June 11: By all odds the best mine in Alamo is the Aurora. It is making its owners rich. The little five-stamp mill grinds away on rich soft rock day after day. The main vein is 7 feet wide, and so little troubled with water that a Swede with a cistern pump is all that is needed to get the water to the main pump, where the main steam pump works. The rock is so soft that a three-foot hole was drilled in an hour and a half. A fine piece of about two cubic feet taken out was reserved for the Columbian Fair, but it was accidentally broken. It showed streaks of the yellow as wide as a finger, which ran clear through the piece in layers. The San David shaft is down over 80 feet and drifting toward the ledge will soon begin. In the meantime the Princess mill is running on custom and tribute rock. The Placer mine has been furnishing it some very fine ore the past week. The Mountezuma mine and mill are very busy. The vein developed finely, and although the rock grows harder, it is also solid and less broken. A railway will be put from the mine to the mill pump if the mine improves. Newell's vein has been reopened, and tributaries are also working on Ulysses, Indio, Princess, Gold Tree and Telemaco ground.

OREGON.

THE GOLDEN CITY CO.—*Albany Herald-Democrat*, June 13: An important mining deal has been entered into by the Golden City Mining Co. and Mr. Richard Harrison of Denver, Colorado, which means a great deal for the Santiam mining district. Mr. Harris, who is a wealthy mining man, and is also backed up by other Denver mining capitalists, for the consideration of a block of stock in the Golden City, has agreed to put in a ten-stamp mill and a sawmill, wire-run tramway and other improvements, the cost of which will overrun \$50,000.

This contract means the development of the 20 valuable claims belonging to this company, and the bringing of a large working force into the mining district contiguous to Albany. Mr. Harris is a miner of experience and sound judgment, and, after prospecting the Santiam mines, pronounced them the best in the United States. The action is certainly one of importance for Albany. It will soon be followed by other movements upon other claims that will be of equal importance.

NOTES.—*Jacksonville Times*, June 19: The mineral resources of Southern Oregon are attracting much attention from a number of prospectors from abroad. Work has been resumed at the Swinden mine near Gold Hill by parties whom Dr. Braden has interested in the enterprise. Band & Denoff have finished cleaning up at the Miller mine on Farmer's flat, but made only a fair run, owing to the scarcity of water. The mines at Diamond peak, Klamath county, are attracting numerous prospectors already, and the indications are that it will prove to be a camp of importance. Most of the small placer mines have closed down for the season, but those operated by hydraulic process are generally running yet. The wet spring has greatly extended the season, much to the benefit of the miners. Since the discovery of the chrome deposit near Etna, two mineral claims have been located there, in order to secure control of the paint mine, which will doubtless prove valuable in time, the deposit being remarkably pure and free from foreign substances. The Patton ledge, located in Talent precinct, which was partially opened some years ago, but never extensively worked, has yielded considerable high-class ore since being leased last long since by Messrs. Hankett & Co. A yield of \$30 to the ton for surface ore is not to be sneezed at anywhere, especially when there is plenty of the rock in sight for a long run.

NEW MEXICO.

DEVELOPMENT WORK.—*Silver City Enterprise*, June 26: Chauncey Story, the owner of the old Castilian Turquoise mine near Bonanza City, recently got \$1000 for one nugget of turquoise. Wm. Elderton is moving the Thomas concentrator from Kelley to Patterson camp, Socorro county, where it will be set up and put in running shape. The Kingston Shaft is creditably informed, and from a source which ought to know, that there is no doubt of the early starting up of the Lady Franklin. It is rumored a deal is on hand to lease and bond the Maud S. at Silver creek. If the trade goes the hill will be started without delay and the claim will again be on the list of producers. John A. Miller and Frank Daly have gone to Carlisle. Frank will inspect a hoisting plant at Carlisle and if it is in good repair it will be removed to the Hobson group where it will be used in the development of that property. Regular shipments still continue from the new silver camp at Carlisle. The shipments seem to average higher than those of any other camp in the county, and so far almost every mine in the camp has more than paid for its development. A 5600-pound lot of the heavy zinc ores of the Pacific were recently shipped to Joplin, Mo. The ores contained over 17 per cent zinc and in addition to the cost of treatment, transportation, and mining netted \$38 per ton in gold and silver. At Gold Hill, Tom Foster has a bonanza in the new shaft on the Reservation. For a considerable distance above, and down to the bottom of the shaft there is a vein of free milling gold ore one foot in width, which averages \$180 per ton. The mill will be started immediately after the Fourth of July, and ore from the Reservation and other custom ores worked when the boys will have plenty of yellow eagles. H. McIntosh from Georgetown reports the camp as reasonably prosperous. Bragaw is working a good many men on his leased ground, and will soon start up the old Payne, Washington Co. mill on low-grade ores.

Mining Share Market.

The mining share market ruled dull throughout the past week, with a slight (about 10 per cent) recovery in prices. The tone is strong and healthy, although usually well informed operators look for lower prices sometime in this month, and then the starting of the deal. While lower prices, except in a few stocks, may not come, yet gudgeons who buy on a margin had best go slow, for if the pool succeeds in getting enough stocks on a margin they will inaugurate a bear raid and "scoop" them into their already well filled wallets or boxes. The mines were never before in so good condition for a big and successful deal as now, and that it will come is as certain as the sun will rise on tomorrow but it takes time to get it well under way. Those who have their stocks paid for and will pay one more assessment provided it be levied, will have no cause for regret in baving done so. The pool will unquestionably levy a line of assessments to get those gudgeons to sell at low prices, who invariably buy when the market is up.

In official circles it is claimed that Con. Virginia will declare a 50-cent dividend on the 15th of this month.

The assays of the Con. Virginia are being purposely reduced. This is part of the pool's game of bluff. While Con. Virginia is held up as an object lesson and the market worked according to its erratic movements, yet in the deal there are other stocks which will go much higher proportionately.

It now looks very much as if Com. Flood bought the wrong stock when he had his man "Friday" pick up Andes. Evidently he labored under the belief that the big development found to the west, in Con. Virginia is in the Andes ground, whereas it is claimed by the West Con. Virginia's, whose grounds are patented. Such is life, even the best get left by going too far west.

Pumping out the Gold Hill mines will receive a new impetus when the Alta pumps are started up. This starting up of the pumps by the Alta management has been looked for with keen interest by outside stock operators, for it was claimed that it would give new life to that end of the lode. The work was delayed until the Alta group pool and the Comstock pool got more mining shares. It is quite likely that the pumping operations will be made to do service in breaking stocks whenever the pool catches gudgeons with good lines on a margin.

The two stock boards adjourned over from Wednesday afternoon until Tuesday morning, July 10th.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 23, 1891.

454,586.—FERMENTING VAT.—U. Bachmann, S. F.
454,609.—PUMP.—Geo. Brown, Wausburg, Wash.
454,715.—AODING MACHINE.—D. L. Craig, Silver King, A. T.
454,638.—WATER WHEEL BUCKET.—W. G. Dodd, S. F.
454,679.—SAW SETTING MACHINE.—C. A. Erlandson, S. F.
454,821.—WAVE POWER MOTER.—H. P. Holland, S. F.
454,538.—APPARATUS FOR EXTRACTING GOLD ETC. FROM ORES.—Howe & Gates, S. F.
454,744.—COATING FOR FILES ETC.—F. E. Lamper, S. F.
454,616.—SASH BALANCE.—Benj. Marshall, S. F.
454,573.—ELECTRICAL PESSARY.—W. N. Sherman, Merced, Cal.

The following brief list, by telegraph, for June 23 will appear more complete upon receipt of mail advices: California—William N. Anderson, San Rafael, elevator safety device; Alpheus J. Bartlett, Pomona, sprinkler; Frank L. Bates, Sacramento, smoke consumer; Stephen H. Chase, San Jose, sawmill holder; Michael Dillenburgh, San Francisco, pipe coupling; John A. Driller, Los Angeles, separator, and Edmund L. Kenoyer, Hartford, equalizing device for windmills; Dr. F. Oliver, San Francisco, assignor to Acme Harvester Company, Peoria, Ill., hay rake; Albert A. and F. B. Stout, Fowler, valve for sinks and water-closets; Edwin F. Tucker, San Francisco, hot-air bridge; Dyson D. Wase, assignor one-half to E. W. Tucker, San Francisco, electric signal for steam vessels, Washington; John S. Griffin, Roslyn, casting machine; Samuel Griswold, East Davenport, wind engine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FERMENTING VAT.—Ulrich Bachman, S. F. No. 454,586. Dated June 23, 1891. The object of this apparatus is to thoroughly ferment a liquid which for some reason has ceased to ferment by the ordinary process before all the sugar in it has disappeared. The fermentation of the liquid is a chemical process which is conducted by fermenting germs. These convert the sugar in the liquid into alcohol, carbonic-acid gas, etc. Under unfavorable circumstances these germs cease to act before the fermenting process is complete and consequently the sugar remains unfermented, and the liquid will lose in value. The main thing to which attention is to be directed is to conduct the treatment in a way to make it as favorable as possible for the growth and progress of the fermenting germs. There are, especially in wine-making, many causes for these germs gradually being destroyed. The only way to give this wine new life is to bring it in contact with new fermenting-germs. In this apparatus, in the center of a tank is placed a shaft having plates connected with it and the whole space inside the tank between the plates is filled up with a porous or absorbent material such as sponge, comminuted cork, etc.; grape stems will answer the purpose. The tank is filled with liquid which starts fermenting. The fermenting germs in this liquid will settle all over and into the pores of the porous substance, and will grow and multiply much more rapidly than when they are floating freely in the liquid, and therefore the fermenting process progresses more swiftly and thoroughly. By this action, the necessary fermenting germs are transplanted into the porous substance and consequently are contained in the machine, and if the proper temperature is maintained, then as long as the albumen and sugar are present the fermentation will progress. When the liquid has fermented sufficiently and is drawn off, the germs will remain in the pores of the absorbent substance. The apparatus can now be refilled with the faulty liquid, that is to say with a liquid in which for some reason the fermentation has stopped and will not proceed by any of the ordinary processes. Now if the proper temperature be kept up the germs will begin their work upon the faulty liquid and said liquid can thus be carried to the proper stage of fermentation. After continued use the apparatus can be washed, the water being agitated by the turning of the shaft. Increase or decrease of temperature can be obtained by pumping in cool or warm air by a means provided.

ELECTRICAL PESSARY.—Walter N. Sherman, Merced, No. 454,573. Dated June 23, 1891. This invention relates to that class of pessaries made of some yielding material and adapted to be carried to and left in place by a tubular carrier or cylinder having a plunger or piston. The invention consists of a peculiar disk or diaphragm adapted to receive a proper button or cup which is intended for healing purposes. It also consists, in connection with said disk or diaphragm, of a button constructed to generate a mild current of electricity for therapeutic purposes. The object of this invention is to provide a simple and readily applicable pessary adapted for the treatment of various womb diseases for which electricity is often recommended by physicians, also for the application of various medicaments and at the same time providing a useful support.

SASH BALANCE.—B. Marshall, S. F., assignor to the Marshall Improved Window Furniture Co. No. 454,616. This invention relates to that class of sash-balances in which a spring is employed and which operates a pinion engaging a rack. It consists in certain improvements in this class of device, and especially upon that sash-balance patented by the same inventor No. 420,425, Jan. 28, 1890. These improvements may be briefly stated to be the connection of the pinion and rack,

which while holding the two together permits the proper travel of the former upon the latter; the peculiar attachment of the rack; the location of the spring, when desired, in the sash-stile and the connections rendering this location practicable. The principal improvement lies in the connection of the pinion and rack. This is a positive one and is effected by means of a sliding sleeve. The object is to hold the two well together, notwithstanding shrinkage of the wooden parts, and yet to provide for the necessary freedom of the sash without liability of the disengagement of the rack and pinion. To this end the rack is suspended, thereby permitting it to have a slight swinging motion to conform to the movement of the attached pinion which is carried by the sash. This connection also makes of the device a single thing adapted to be readily applied as such.

CARTRIDGE LOADER.—Geo. B. Jacobs, Partial, Mexico. No. 454,578. Dated June 23, 1891. The object of this invention is to provide an efficient machine for loading cartridges of all kinds and sizes. It consists essentially of rotating magazines containing the materials with which the shells are to be loaded, directing chutes below for conveying these materials, a rotating holder for the shells which brings each shell into communication with the several chutes and reciprocating plungers or rammers operating on the charge in the shell. The several movements of the magazines, shell holder and rammers and plungers are effected by the operation of a single lever which vertically moves the central shaft or axis of the machine. The entire operation of loading is a continuous one, the shells being successively brought into position to receive the materials and to have performed upon them the necessary operations of loading.

SAW-SETTING AND NO. FILING MACHINE.—Carl A. Erlandson, S. F. No. 454,679. Dated June 23, 1891. This invention has for its object the filing and accurate setting of the teeth of saws by machinery. It consists of adjustable saw-holding clamps, cranks, guides and connecting rods by which the files are reciprocated, springs by which they are held down to their work, devices by which the files are adjusted to suit the angle of the teeth of different saws, a pawl mechanism to advance the saw as the filing of each tooth is completed, means for adjusting the throw of the pawl to suit the different spacing of the teeth of different saws, pins for setting the teeth of the saw and reciprocating burrs by which they are actuated, means for supporting the backs of saws having different taper and posts with vertical adjustment to suit the different widths of saws, together with many minor mechanical devices operating to produce these results, which cannot be intelligibly explained without engravings.

A Practical Business Educator.

Farmers alive to their interests are appreciating more and more the necessity of a business education, to enable them the better to cope with merchants and others in the struggle for the necessities of life. Perhaps no institution offers better facilities for the securing of a business education, in all its practical bearings than does the Pacific Business College of this city. An exchange very aptly states that "the value of a good education can scarcely be over-estimated. To the young man entering upon the active duties of life, a practical education is of prime importance. It is his stock in trade, by means of which he may lay the foundation of future prosperity and independence. A thorough business education, such as can be had at the Pacific Business College, is always available capital, and is of inestimable value to any one starting out in the world, with its prizes to win by knowledge, skill and capacity, or to lose through ignorance, incompetency and neglect. Prof. T. A. Robinson, the president, is one of the best teachers on this coast of mathematics, book-keeping, and the various branches of commercial sciences, as the hundreds of young men who have been so fortunate as to receive instructions from him can bear testimony. The several courses of instruction are thorough and practical, the halls and recitation-rooms are large, well lighted and well ventilated, and every facility for comfort and advancement is provided without regard to expense."

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their San Francisco Patent Agency (S. F.) from week to week and year to year.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

THE Los Angeles electric bell railroad has commenced operations.

MECHANICAL PROGRESS

How Aluminum Is Made.

More than ordinary interest attaches to the subject of the production of aluminum because of the rapid strides which have been made in cheapening its mode of manufacture within the last few years. The gradual evolution of this manufacturing process has reduced the cost of this remarkable metal from \$91 per pound, which was its cost in 1885, to \$1 and less per pound—its present price. Some of the devices by which this cheapening process has been brought about have been patented; other alleged processes are kept profoundly secret from both the patent office and the world. The June number of the Proceedings of the Massachusetts Institute of Technology contains a paper upon the above subject by Mr. Alfred E. Hunt of Pittsburgh, in which the writer describes the Hall process of manufacture, which is employed by the Pittsburgh Reduction Company and the one in which electricity plays the chief part.

This process, according to Mr. Hunt, consists in electrolyzing alumina, dissolved in a fused mixture of fluorides of aluminum and sodium, or fluorides of aluminum and potassium, or of fluorides of aluminum, together with the fluoride of any metal more electro-positive than aluminum.

The mixture of fluoride salts is first placed in a row of carbon lined iron tanks placed in series. The pots containing the reduced metal in the carbon lining then become negative electrodes or cathodes. The positive electrodes or anodes are a series of three-inch carbon cylinders attached by three-eighth inch copper rods to the copper conductors by means of binding screw clamps. A current of 5000 amperes and 50 volts in one series and of 2000 amperes and 20 volts in the other series is turned on, and the mixture is melted by the heat caused by the resistance offered to the current by the fluoride mixture.

In less than two hours' time the mixture becomes fluid, and alumina is added, when the electrolyte becomes a much better conductor and "the resistance of the pot" goes down to a normal one of about eight volts. Then the process of electrolysis begins. The alumina in the solution is decomposed, and the metal, being heavier than the electrolyte, sinks to the bottom of the pot. The oxygen goes to the positive carbon electrode, uniting with a portion of the carbon and escaping as carbonic acid gas. The heat is retained in the molten bath by a covering of finely powdered carbon spread on its surface. On the top of this carbon the powdered aluminum is placed, and when the volt meter attached to each pot shows a rising resistance, more heated ore is stirred in from the surface, the carbon soon rising to the top. The feeding is thus made easily continuous, being run, in fact, for months at a time. The advantages asserted for the slow and continuous feeding are purity of the metal, saving in loss of metal and economy in heat.

Commercial aluminum, writes Mr. Hunt, is never chemically pure, silicon and iron being almost always found. For many purposes the purest aluminum cannot be so advantageously used as that containing three or even four per cent of impurity, as the pure metal is very soft and less strong than the impure. It is only where extreme malleability, ductility, soundness or non-corrodibility is required that the pure metal should be chosen. Stiffness and hardness are very much increased by cold hammering, cold rolling, drop forging and other processes. Sound castings of aluminum can be readily made in dry sand molds.

A GOOD MACHINIST.—A correspondent of the *American Machinist* says: "There is a good deal of difference between being a good machinist and 'knowing the machinist's trade thoroughly.' I have been in the business 30 years, but don't know it thoroughly yet, and don't ever expect to; but I hope I was a 'good machinist' 25 years ago. There is so much that is new constantly coming up that one man cannot grasp it all. The best one man can do is to be called a 'thorough machinist,' which means that he is able to study up ways and means for well and economically doing such work as falls into his hands. Give him a forging or a casting and a drawing, and the thorough machinist can see in the rough metal the finished work, just as the sculptor can see the perfect statue in the rough block of marble, and knows just how to strike with mallet and chisel to bring out the perfect work of art. Just so the 'thorough machinist' can see the finished work, and his machinist's instinct and training tell him how to set at work the shop tools to get out of the rough iron the finished work. And so it goes; some young men can make themselves into good machinists in six months, some in twelve months, some in two or three years, and some will never get there with the traditional seven years' apprenticeship, and had better do something else; but of all the different kinds, give me the six months man. He is the one who was 'horu a machinist,' and he will continue to learn and become more valuable all his life."

EVOLUTION OF THE KNIFE.—"This case full of implements which we have newly placed on exhibition is designed to show the development of the tool which we call the knife, beginning

from the earliest times," said Prof. Mason at the National Museum to a Washington *Star* reporter. "First, you observe, is the fragment of flint which the savage split by hanging it on the top with a stone hammer into a number of flakes. The smaller ones were used for arrow points and the bigger ones for knives, their edges being split off so sharp that you might almost shave with some of them. Next you see the flint flake fastened into a handle of split wood or bone, and, as further improvements, the fastening of this primitive knife in the handle by the resin of trees and by cord of one sort or another bound round to secure it. The most beautiful knife in the collection is the exquisitely molded blade of greenish jade belonging to the stone age handed with a walrus tusk. You can hardly find a more admirably formed weapon among the products of modern cutlery wares. Most curious of the modern tools here is the sailor's knife, square at the end instead of pointed, to prevent stabbing in a row or the dangerous falling of the weapon from aloft. Its blade drops out at the end of the handle when a catch is touched, so that Jack can hold a rope with one hand and open the knife for service without the need of ten fingers."

Expansion of a Long Steam Pipe.

Several months ago, a careful determination of the expansion of a long steam pipe was made by direct measurement at the University of Minnesota. The pipe was laid in a brick-walled trench, or conduit, supported on rollers, and the experiment was made before covered up. This was a four-inch wrought-iron steam pipe, the part measured being a straight section 210.6 feet long, terminating at each end in an elbow.

The length was first accurately measured (between two points marked on the inner face of the elbow flanges) by means of a standard steel tape.

At each end of the pipe, a strip of iron was built up in brick piers, so that the strip passed over the top of the pipe, a few inches inside of the elbow flange, with which it was parallel. The strips were stationary and entirely free from the pipe, so that by calipers the distance between a strip and the flange, before and after heating the pipe, the movement at the end could be accurately measured. This operation was, of course, gone through with at the other end as well, the sum of the two giving the total elongation.

The measurements were taken between three and four P. M. of a cool, cloudy day, and as the temperature had been very constant for several hours, it was assumed that the temperature of the pipe was the same as that of the air in the conduit, viz.: 43° Fahrenheit. Having taken the initial measurements of this temperature, steam was turned on and allowed to remain until no further expansion was observed. The temperature was read by a good thermometer and checked by a steam gauge, both inserted in the pipe. The average temperature was taken at 300 degrees, making the range of temperature 300—43=257 degrees. The elongation of pipe was found to be 2.28 inches at one end and 2.17 inches at the other, giving a total expansion of 4.45 inches.

This means that the expansion per degree Fahrenheit was .00000635 of an inch per inch of original length, or the same fraction of a foot for each foot of the original length, etc. This is equivalent to an extension of .00822 inches in each 100 feet of original length, per degree, or to a linear expansion of 1.48 inches (nearly) per 100 feet, in changing the temperature from 32 to 212 degrees.

VARIETIES OF TAP CINDER.—This subject which is of much importance to iron manufacturers, has received attention at the hands of Mr. Thomas Turner, the well-known lecturer on metallurgy at Mason College, Birmingham, and he has presented a first abstract of the results of his tests to the South Staffordshire Institute of Iron and Steel Works managers. For his experiments Mr. Turner obtained samples of boilings and tappings, both taken from the same heat, from various works during ordinary working with different irons. The samples were broken up and passed through sieves, being examined by eye, and with a moderately powerful magnet for globules of iron. It was found that all the boilings yielded globules of metallic iron, while none were met with in any of the tappings. The boilings yielded as much as 16 per cent of metallic iron—hence such a slag would mean a preventable loss of 3½ per cent of puddle bar, or equal to \$2500 a year on 300 tons of puddled iron per week. All the tests showed that the boilings were distinctly more impure than the tappings, and the analyses made by Mr. Turner show that for economical puddling it is necessary to hold away a considerable quantity of the first impure cinder so as to be able to obtain a pure tapping cinder with the use of the smallest possible quantity of fettling.

WASTEFULNESS OF STEAM HAMMERS.—To obviate the notorious wastefulness of steam hammers an improvement has been introduced at the Chemnitz Works, in fitting the hammers with two platens of different diameters, compounding them, in fact. The top is raised by steam at boiler pressure acting on the under surface of the smaller platen; and this steam, on expanding, adds to the force of the blow by acting on the upper surface of the larger platen.

SCIENTIFIC PROGRESS.

The Next Advance in Telescope Making.

Why, asks the *Pall Mall Budget*, is it so difficult and expensive to construct an immense telescope? From the time of Galileo to that of Clark, steady work has been done, and each step has given us a larger object glass. The pupil of the eye is one-fifth of an inch in diameter, and can grasp but a limited amount of light. A 25-inch object glass will enable the eye to take in over 15,000 times more light, and with such a glass the moon can be seen as though it were only 80 miles away; but if the size of the object glass could be further increased, the moon would be brought considerably nearer. To make a large object glass is the difficulty, and it is only after years of patient work of the most skilled men on earth and after repeated attempts that one can be produced which is accurate. Slight differences of specific gravity, changes of structure due to jarring, strains resulting from unequal pressures and changes of temperature, are all capable of ruining the work. Some one who is anxious to anticipate events has asked: Why not replace the glass, which is only a medium transmitting light at a different velocity from air, by a properly constructed electric field? It is conceivable that an electric field 50 feet in diameter could be arranged. Just what the nature of this field should be, with our present knowledge, we cannot say, but some day it will be known, and then the secrets of the other planets will be ours. Either (says a technical paper) is now paramount with experimentalists; some day it will form the basis of all electrical text books. We seem to be on the verge of discovering something really great in the world of ether. The early experiments of Faraday, the marvelous mathematical researches of Maxwell, and the crowning experiments of Hertz, all show the intimate relations which exist between electricity and light. They have so entirely changed our views of science that it has been truly said that electricity has annexed the whole domain of optics.

Can Monkeys Talk?

In our issue of January 31, an article appeared under the head of "The Language of Monkeys," in which a somewhat extended notice was given of a very interesting study, which was being prosecuted by Prof. R. L. Garner, of the Smithsonian Institute, in regard to the language of monkeys. The professor had already become satisfied that the monkeys were in possession of a language that was understood by themselves, and which he thought he would eventually be able to so interpret that it might be also understood by man. The professor has continued his investigations with what he evidently considers a marked degree of success. Quite recently he has written to the *New York Herald* that his investigations of sounds made by monkeys convince him that they articulate speech from which the tongues of mankind could have been developed. They use their lips very much as men do.

In his investigations he makes use of the phonograph, and says: "The monkey tongue has about eight or nine sounds which may be changed by modulation into three or four times that number. They seem to be half way between a whistle and a pure vocal sound, and have a range of four octaves, and they all chord with F sharp on the piano. Faint traces of consonant sounds can be found inwards of low pitch, but they are few and quite feeble, but I have had cause to believe they develop in a small degree by a change of environment. In their present state their speech has been reached by development from the lower form. Words are monosyllabic, ambiguous and collective. Having no negative terms, except of a resentment phonic character, their speech is very much the same as that of children in their early efforts to talk, except as regards pitch. Their language seems to obey the same laws of change and growth as the human speech."

A SUBMARINE BOAT. says a contemporary, is being built in which enough air can be stored to sustain two men 24 hours, using electricity as a propelling power. Why use "stored" air when the water in which the boat is submerged contains an abundance of free air to last "two men" an indefinite length of time? A very small tank with a fine sprinkler attachment, by which a spray of water from the outside can be thrown into the interior of the boat at intervals, would not only afford an abundance of pure air for the occupants, but would also absorb the carbonic acid gas contained in the vitiated air. A very small area of the propelling power would be sufficient to force the water so admitted, back to the exterior. Experiments in this direction with diving bells have shown that this method is perfectly practical. Some absorbent of the carbonic acid gas must be employed where compressed air is used. Why not make use of water for both purposes?

A GLASS FIRE BLOWER.—Everybody dislikes the iron fire blower, which we have to put up in front of our grates to start the fire. What promises to be a great relief in this direction is a glass blower which has been invented by a New Yorker. The blower rests against the rear

surface of the side posts of the mantel, and is held across the upper part of the fireplace opening, while its lower edge is sustained in hook clips fastened to the wall or the uprights of the mantel, and its upper edge in a stud or clip fastened to the fireplace wall. By these means the blower is always held to the fireplace loosely, so that it can readily contract or expand without danger of fracture. With a blower of this kind the fire is visible, and the room will always be lighted by the fire whether the blower is in use or not.

IS CULTURE HEREDITARY?—Prof. Lester F. Wood says that the whole point at issue is whether there is a causal relation between the cultivation of the mental faculties and their development; in other words, whether the increment gained by their exercise is transmitted to posterity. Prof. Weismann and most of his followers, constituting what is now generally known as the school of Neo-Darwinians, deny such transmission. If they are right, education has no value for the future of mankind, and its benefits are confined exclusively to the generation receiving it. So far as the inculcation of knowledge is concerned, this has always been admitted to be the case, and the fact that each new individual must begin at the beginning and acquire all knowledge over again for himself is sufficiently discouraging and has often been deplored. But the belief, though vague, has been somewhat general that a part at least of what is gained in the direction of developing and strengthening the faculties of the mind, through their life-long exercise in special fields, is permanently preserved to the race by hereditary transmission to posterity of the acquired increment. We have seen that all of the facts of history and of personal observation sustain this comforting popular belief, and until the doctors of science shall cease to differ on this point and shall reduce the laws of heredity to a degree of exactness which shall amount to something more like a demonstration than the current speculations, it may perhaps be as well to continue for a time to hug the delusion.

DIVORCING LIGHT FROM HEAT.—Professor Langley has shown that our best sources of light are surpassed by nature in one very important respect—the production of light unaccompanied by heat. Of the energy supplied by gas and oil for lighting purposes, much more than 99 per cent is given out in heat. Even in the electric arc light the waste is 90 per cent, and in the incandescent lamp 95 per cent. The insect world is much more economical. The most careful measures made with the delicate bolometer fail to show any sensible heat in the light of the firefly. There is no reason why nature should not be successfully imitated in this respect, and Professor Hertz hopes to devise a method of obtaining better results than we now do, from our present ordinary means, in getting electrical vibrations similar in every respect to those of light, but of greater wave length. By modifying his original apparatus, he has some prospect of producing waves so much shorter than all of them will be luminous; in other words, of developing a new source of light without heat. This result, if successful, will be an entirely new method of illumination differing as widely from the present electric lights as they do from gaslight and lamplight, and surpassing them all in economy and comfort.

IRIDESCENCE IN TABLE GLASS.—It appears that the iridescent film is slightly soluble in water, and what is left of it easily yields to the solvent action of caustic soda, while it is not affected by the action of strong hydrochloric acid. When the solutions in water and in caustic soda are examined, it is found that these solvents have taken up sodium sulphate acid and carbonic acid. The portion of the film that is insoluble in the acid can only be silica, for even the spectroscopic will not reveal the presence of lime. The iridescent film is usually found associated with one side only of the glass, and it must be formed during the final heating of the ware. It is probably caused by the action of the sulphurous acid which exists in the burning gases. This acts upon the surface of the glass, forming sodium sulphate and silicate. The latter is afterward decomposed, when free silica separates out in an amorphous form, and this is that portion of the film which resists the action of the hydrochloric acid, and is dissolved by the caustic soda.

There is now being finished at Greenville, Pa., a disk of glass for a refracting telescope lens, which is claimed as the largest that has ever been made in the United States. The disk is 30½ inches in diameter by 5½ inches in thickness, and weighs over 300 pounds.

A POSSIBLE SOURCE OF DANGER.—It is found that the "sparking" visible when switches are turned on or off—to say nothing of that seen at dynamo brushes—will ignite the ordinary vapor given off by petroleum.

EFFECT OF THINKING.—An Italian physiologist of repute, named Mosso, has demonstrated by experiment that thinking causes a rush of blood to the brain, which varies with the nature of the thought.

AZONE FOR RESTORATIVE PURPOSES.—An English physician has invented a cabinet for the generation of ozone for restorative purposes. The ozone is produced by electricity,

GOOD HEALTH.

A New Disease of the Strawberries.

According to the Philadelphia Record, a comparatively new disease has made its appearance in the Quaker city.

"Strawberry rash" is the name given to the epidemic which has appeared this season to an unusual extent. Physicians claim that while the disease, which takes the form of a rash, has in previous years made its appearance at this season, never before has it been so prevalent. The rash attacks the skin, which breaks out in large red blotches similar in color to the berry from which it takes its name. It is no respecter of age, attacking young and old alike.

"There is no known cause for the ailment," said Dr. J. C. Wilson, when approached upon the subject. "I, myself, am subject to it, and in consequence am obliged to refrain from eating strawberries. I don't know why some people are subject to it and others are not, any more than why some people are liable to catch rheumatism or any other disease, while other people, under the same circumstances, are exempt. I only know that the rash exists, but I don't know why."

All over the city people are suffering from the effects of the insidious berry. In several cases whole families have it. While not interfering with the general health, it is accompanied by an itching sensation that renders it annoying in the extreme. Many people are ignorant of the cause of the suffering. Others, having heard of the existence of strawberry rash, have tabooed the berry, and find themselves benefited by abstaining from it.

Physicians unite in saying that the rash has never before appeared to such an alarming extent. Nearly all the doctors in the city have several cases on their hands, and there are many instances which have failed to come under their notice. In every instance where the patient has stopped eating strawberries the rash has greatly diminished or entirely disappeared. Whether there is any germ of the disease in the berries which have come to this market is a matter of conjecture.

INVESTIGATING LEPROSY.—The rapid increase of leprosy in India has induced physicians there to make a special study as to its origin, and, if possible, cure. It is now said that the Commission of Investigation, which was some time since appointed in Allahabad, in North-west India, have succeeded in isolating and cultivating the bacillus of leprosy. They accomplished this in an artificial medium, consisting of bouillon and gelatine, with which they inoculated a rabbit. The animal speedily developed leprosy nodules under this treatment. This is the first time the bacillus of the terrible disease has been successfully grown outside the human subject, it is not improbable the researches and experiments of the Commission will lead to exceedingly interesting, if not wholly practical results.

This committee is preparing a report which, it is said, when printed, will prove very interesting reading to the medical fraternity. It will present the most complete, scientific study of the subject ever given to the world. The Commission, which is composed of medical experts, has visited leper hospitals and studied the condition of lepers in prisons, in streets and in some of the isolated places. Every part of India where leprosy prevails has been locally studied with a view to ascertain how far the conditions of environment assist in propagating the disease. Some thousands of cases have been examined. Microscopic researches made into the distribution of supposed bacillus of leprosy and a series of bacteriological investigations were conducted which are said to have given astonishing results, promising a cure of this hitherto irremediable disease.

IS EGYPTIAN CORN POISONOUS?—No little excitement has been created in the vicinity of Red Bluff during the past few days, growing out of the poisoning of a large number of cows which had been feeding upon growing Egyptian corn. A Mr. Wilton first lost 30 cows, who died almost immediately after eating the corn in the field. At first it was thought poison had been maliciously or otherwise scattered upon the corn, but a day or two afterward under sheriff Fish of Red Bluff lost two cows in the same manner several miles from the locality of the first case; and now comes a Kansas man who says that Egyptian corn will kill cattle very suddenly if eaten at certain stages of its maturing growth. The case is an interesting one and should be carefully inquired into.

KOCH'S LYMPH.—Late reports from Portland, Oregon, state that Koch's lymph is no longer an experiment, for two patients who were given the treatment in St. Vincent Hospital have been discharged cured. The physicians are surprised with the success of the remedy, and believe that the lymph is a specific for tuberculosis if given the patient in time. It is a significant fact that only in these two cases were the physicians satisfied that the disease was genuine tuberculosis. In the other cases undergoing the treatment they have thus far been unable to discover any bacilli. Eastern papers state that important improvements have recently been made in the manufacture of the lymph.

STEAM BOILER NOTES

What Should a Boiler Be?

In considering the points of a horse, any one who is well posted will tell you at once that he should have a wide forehead, fine muzzle, large nostrils, oblique shoulder blade, long and muscular forearm, broad nose, flat cannon bones, deep chest, short back, etc. Every horse lover has the good points of a horse "down line." But with such an important matter as a boiler, who knows the desirable points, or can repeat them off hand?

But the desiderata of a boiler has been or can be formulated, and it should be interesting to note what they are.

In the first place, it should be safe. Then it should be simple, convenient to get at, around and into; easy to handle and repair; compact; quick to steam, constant in its circulation, and steady, too; free from smoke, able to work with any kind of water, good, bad, or indifferent; and dry steamer; and, of course, economical of fuel.

In order to be all these things, the heating surface must be so arranged as to heat take the heat from the gases of combustion, and so as also to let the steam which is generated get away from those surfaces as rapidly as possible. It must be strong enough to stand any pressure that can be got in it by fair means; and should have a safety valve which will let off all the steam that can be generated in it, even if none is being drawn off. There must be no place where unequal expansion will make the boiler its own enemy. It must be saving of fuel, not only at some one rate of steam production, but at the regular rated capacity; and while it cannot be expected that a boiler will do as well with bad fuel, bad water and bad firing as with all these three good, it must be economical with all three bad.—*Power and Transmission.*

FOUR CYLINDER ENGINES.—The introduction of the new triple expansion engines, having four cylinders, into the large mills at Fall River has proven a success, according to the New York Sun, which in describing the engine says: "It is a triple-expansion engine, with four cylinders. The steam, instead of being carried to a single large cylinder for its final expansion, is divided between two, whose combined capacity is such as to bear the required proportion to the intermediate. The high-pressure cylinder, with one of the low, is upon one side of the engine, and the other low pressure, with the intermediate, upon the other, the crank being set at an angle of 90°. This secures for the engine an equal distribution of the load between its two sides, when, as will normally be the case, the work done in the high pressure and intermediate cylinders is equal. The cylinders are proportioned as follows: High pressure, 20 inches in diameter; intermediate, 34 inches; and two low pressure, 36 inches each, the stroke being 60 inches upon each side. The cylinders are steam-jacketed all over, heads as well as barrels, and the steam passes through these jackets on the way to the cylinders. The satisfactory results of this arrangement would seem to admit of no doubt, judged by the published figures; that is, tests show that the engine develops its load of about 1000-horse power upon an average consumption of 1455 pounds of coal per horse power per hour."

BANKING FIRES.—The fire in a boiler was banked over night, and during one evening a considerable portion of the water leaked out. In the morning, the fireman stirred up his fire, and then noticed there was no water in sight, and, considerably frightened, he drew the fire and waited for the engineer, not daring to put in water. The engineer did not get excited, but took a piece of waste, wet it well, put it on the end of a poker and rubbed it over the boiler-plate and appeared satisfied. "What do you do that for?" inquired the fireman, and from the engineer's reply he gathered that if the plates were overheated, the water left by the wet piece of waste would show it by quickly evaporating; but if they were not overheated, the water would remain on the plates.—*Ex.*

THE CONDENSATION OF STEAM IN PIPES.—It is sometimes convenient for an engineer to be able to approximate the amount of condensation that will take place in pipes during a certain length of time. From many experiments made on the condensation of steam in wrought-iron pipes, when exposed to the open air, it is found that one pound and six ounces of steam per square foot of pipe's surface was condensed per hour when the difference in temperature between the steam and air amount to 200°. As this is very nearly the difference of temperature usually found between the steam in the pipes and the air on the outside, this simple rule will give results sufficiently close for ordinary purposes.—*Stationary Engineer.*

FORCING BOILERS.—One very important cause of deterioration in boilers is due to the fact of their becoming too small to do the work without forcing, so that the pulsation of the engine causes a well-marked succession of shocks on the boiler, which result in the weakening of the material. By placing one's hand on the head or shell of the boiler, the vibrations of the metal can be felt, similar to the rising and falling of a man's chest while breathing.—*Exchange.*

ELECTRICITY.

A Competitor for Edison.

Mr. Frank Hartman, a real estate man of Denver, has been working for several years upon the same line more recently taken up by Mr. Edison—the invention of a device which shall be a combination of the phonograph and photographic camera. The idea of both Edison and Hartman is to produce an instrument which will record and reproduce all forms of motion, such as a horse race, game of baseball, operatic performances, street scenes and the like. It does with light what the phonograph does with sound, and by coupling the two instruments it is possible to reproduce a scene showing, for example, an orator delivering a speech with all his gestures and motions, and at the same time hear everything he says, together with the cheers and applause. A play upon the stage may also be so perfectly recorded, that every motion and every word of the different actors may be reproduced in form, manner and speech as perfectly as the best phonograph now records the speech only.

Mr. Edison calls his device a "kinetograph"—a recorder of motion. Mr. Hartman denominates his device a "zotograph," or more plainly, "a seeing machine." The word is from *zo*, flight, and *graph*, to write—recording a flight or movement so that it can be seen.

It would appear from the information before us that Mr. Hartman has been for some time in communication with the patent office, securing his various devices as he progressed, which appear to be very much in character with those of Mr. Edison.

Mr. Hartman's attention was first called to the subject by viewing and studying the productions in rapid photography and the manner in which they were produced by Mr. Maybridge of this city, the apparatus to accomplish which is said to have cost some \$30,000. It has been the study of both these gentlemen to improve upon that process, and to add to it a clever attachment of the phonograph, by which sounds as well as motions could be simultaneously recorded for later reproduction.

The Commercial Value

Of this invention, perhaps, may not be very great, but it will be useful nevertheless. The zotograph will see everything within its range and record the same automatically and correctly. Placed in a car window, it will photograph everything which comes within its range as the car moves along. It will also record the babel of sounds as they pass by. It will record even the slightest progressive movement of a horse in its complete race around a track. All the motions of an athlete, or several of them, may be accurately recorded. Every great parade, every noted assemblage, with their continuous actions and movements, may be recorded upon the sensitive plate, so that those in after time may see them as fully and as perfectly, only considerably enameled, as did the original witnesses. Mr. Edison expects to fix upon the sensitive plate motions as rapidly as 46 per second. Hartman, in his caveat recorded long before anything was heard from Edison in this direction, claims a speed of from 50 to 100 per second, which will make the record appear as if actually in motion, as indeed the picture may be made to move before the observer.

Both these inventors are working more for the love of the thing than for profit, and it is to be hoped they will each realize the fullest hopes of their most sanguine imaginings. Although both are striving for a common end, the means by which they are striving to reach it are somewhat different.

The device, when perfected, will be something more than a scientific toy. It will be a delight for children and an instruction as well as a delight for adults. It will give to public speakers, actors and singers the gift so earnestly desired by the favorite Scotch bard when he sang:

Oh! wad some pow'r the giftie gie us,
To see ourselves as others see us."

A NOVEL IDEA.—At Lawrenceburg, Ind., a novel use was made of electricity in winding wires around a pretty woman who represented the Goddess of Liberty, and thus in lighting up a number of incandescent lamps disposed about her. The current was obtained from the street mains, and the effect elicited the most enthusiastic applause from the spectators.

The work of building the electric road through various streets in this city into San Mateo county to Baden and Redwood City is being pushed rapidly. The poles are now erected past the Seven-Mile House and county line and the men are now at work placing them in San Mateo county on toward the new cemetery.

The use of electricity in mines bids fair in five or six years to far exceed its use in electric street railroading. Such is the opinion of one of the best authorities on the subject.

THERE is now being built at the Thompson-Houston Works in Lynn an electric freight locomotive, which is to weigh ten tons and to be of 60-horse power.

REPRESENTATIVES of the Hayward electric road are securing subscriptions from property owners along the route, and are meeting with success.

USEFUL INFORMATION.

HIDING GOLD IN INDIA.—It is very generally known that large quantities of silver are annually hidden away in India, but it is not so well known that more later they have been laying away gold there. An English writer says that a considerable part of all the gold that goes to India never returns. Having been obtained in the west by the sale of exported productions, it is retained in the east as realized profits, wealth stored up, and, to a moderate extent, for use in the arts; for the rest, as a representative of value on the credit of which traders buy and sell with the bills of exchange they issue and the book credits they open, and settle up the differences with the silver money of the country. But the vast stock of gold accumulated there undergoes no diminution; there is no ebb and flow under the reciprocal action which commerce enforces in the case of countries trading together on a common metallic basis. The three million sterling or thereabout of gold bullion which India annually adds to her store are, under the monetary law of that country, just as much lost to the nations of the west, by being withdrawn from the general commerce of the world, as if the money had been lent to a south American republic. Between the years 1835 and 1889 this depletion amounted in value to £130,292,758.

DIFFERENT KINDS OF GOLD.—"Most people suppose, says an assayer, 'that all gold is alike when refined, but this is not the case. An experienced man can tell at a glance from what part of the world a gold piece comes, and in some cases from what part of a particular gold district the metal was obtained. The Australian gold, for instance, is distinctly redder than the California, and this difference in the color is always perceptible, even when the gold is 1000 fine. Again, the gold obtained from the placers is yellower than that which is taken directly from quartz. Why this should be the case is one of the mysteries of metallurgy, for the placer gold all comes from the veins. The Ural gold is the reddest found anywhere. Few people know the real color of gold, as it is seldom seen unless heavily alloyed, which renders it redder than when pure. The purest coins ever made were the \$50 pieces that used to be common in California. Their coinage was abandoned for two reasons: First, because the loss of abrasion was so great, and, secondly, because the interior would be bored out and lead substituted, the difference in weight being too small to be readily noticed in so large a piece. These octagonal coins were the most valuable ever struck."—*New York Tribune.*

A NEEDFUL INVENTION.—A recent invention is a device for automatically shutting off the gas when it has been blown out, instead of being turned off in the usual way. The principle upon which the invention is based is the expansion and contraction of a metallic loop made of German silver and steel, and which is adjusted very close to the gas flame. One end of the loop is free, while the other is secured to the fixture. A valve controlling the gas is attached to the free end, and when the gas is burning the valve is open and the gas freely escapes. If, however, the gas is blown out, the loop will quickly cool and contract, and the valve will shut off the gas. It is said that the device is exceedingly simple, and it responds quickly to the change in temperature.—*Fire and Water.*

A DISAPPEARING INK.—An ink which, according to the *Effective Advertiser*, seems to be identical with the disappearing ink of about 20 years ago, has recently been placed upon the European market, and is a watery solution of iodine and amylin. It produces a beautiful blue black writing, which begins to fade after a few days, and disappears entirely after the lapse of a week.

COPPERING IRON.—A process has been recently invented by which iron may be coppered by dipping it into melted copper, the surface of the iron being protected by a layer of melted cryolite and phosphoric acid. It has been found that if the article, when immersed, is connected with the negative pole of a battery, the coppering is done more rapidly.

WHAT ONE BLAST DID.—The papers have lately mentioned how many prominent mines of the country were discovered by chance. There is a scrap to be added in the history of the Cortez mines. Simeon Wenban had run the Garrison tunnel at great expense and was left a poor man, owing his creditors \$150,000. There was not a pound of ore in sight whereby the debt might be paid. As a last resort, with a forlorn hope, after the mine had been closed, Simeon Wenban drilled a hole in the hanging wall and blasted out a huge piece of rock, which he found to be almost a solid block of metal, and part of an immense vein which had been paralleled hundreds of feet. This fortunate last effort marked a sudden change that seldom falls to the lot of man. It was Wenban, the poor man, the laborer, before that blast was fired; it was Simeon Wenban, the millionaire, but a second thereafter. The first month's run of his little mill gave him \$30,000, and ever since he has grown more wealthy. The mine is the best paying property in the State at the present time.—*Central Nevada.*



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MINING STOCK MARKET.—Sale in the San Francisco Stock Board, Notices of Meetings, Assessments, Dividends, etc. 12.

MARKET REPORTS.—Eastern and Local Metal Markets; Coal and Coke, etc. 12.

Business Announcements.

[NEW THIS WEEK.]

Machinist and Mechanical Engineer—A. J. Van Drake, Dividend Notice—Pacific Coast Borax Co.

See Advertising Columns.

Passing Events.

California has experienced this week the hottest weather in 40 years, and several cases of sunstroke are recorded, a very unusual thing in this State, where the air is so dry. The thermometer has registered 100° in this city, and considerably higher in the interior.

The influx of water to the salt fields in the low place of the Colorado desert is looked upon almost as a phenomenon, large areas being inundated that have always been dry since the settlement of the country by white people. The region is over 200 feet below sea level, and the water is supposed to be from the Colorado river, coming by seepage through the sands of the desert.

The increased tin-plate duty went into effect on July 1st, and we must now pay \$2.37½ per box of plate. It is the hope of the political economists that this will stimulate the production of tin plate in this country, the raw tin itself coming in free. As yet, however, there are no tin-plate mills at work, and an immense stock of tin plate has been shipped to this country.

On the 1st inst., the new law regarding coinage of silver went into effect, and the local Mint has stopped the coinage of that metal for the present.

LAST Monday was the hottest day in forty years in San Francisco.

California Minerals at Chicago.

On June 20th an editorial was published in the MINING AND SCIENTIFIC PRESS suggesting that, in order to make a display of minerals at the World's Fair, to excel all others in the United States, the extensive collections already belonging to the State might be forwarded, instead of attempting to make a special collection. Mr. Almarin B. Paul writes a letter, which is published on page 2 of this number of the PRESS, commenting unfavorably on this suggestion and saying: "The move is a well-devised plan, however, to save drawing from the \$300,000 appropriation the \$50,000 due the mining industry for making a collection," and also that "it is very clear that the powers that be are figuring, simply to use the mineral exhibit as a cat's paw for other special interests."

Both these statements are entirely uncalled for, since the "powers that be"—the Commissioners—have not yet considered the subject of the mineral collection in any way, as far as we are informed. The "well-devised plan," as Mr. Paul calls it, was simply the suggestion of the PRESS, and did not come from the Commissioners or any one of them. It is absurd to talk of spending \$50,000 to make a special collection of minerals when the State already has far better ones than that amount of money could now obtain.

The object of suggesting that the various State collections of minerals in the Mining Bureau and State University might be taken to Chicago, was that the mining industry of California might be properly represented and make a showing of minerals which would excel all others. State officials have been collecting these minerals, identifying and labeling them for years, and no State in the Union has anything like what we have in this line. The object of the Mining Bureau is to advertise the mining interests of California. It could do it in no better way than to exhibit its collection at Chicago. The State Mineralogist took a collection to the New Orleans Exposition, and there is no reason why that official could not take one to Chicago. There is no reason or sense whatever in spending \$40,000 or \$50,000 of the \$300,000 appropriation in getting together a new lot of minerals when we already have such splendid collections.

Mr. Paul thinks the Mining Bureau might as well close its doors as consent to the removal of the collection. To this an answer is that the museum is only one feature of the Bureau, its main work being in the field now rendered compulsory by the instructions in its appropriation.

It would do no harm whatever to close the museum for a time, but that would not be at all necessary. The whole contents of the museum would not be needed at Chicago by any means. Only a good typical collection need be taken, and there is an abundance of material to draw from.

The main thing is to have California properly represented. By taking the collections already made, we could excel all other States, since none of them are in a position to show what we can. Then the commission could provide means for exhibiting the various California inventions connected with mining and metallurgy. If, however, they are called upon to spend a lot of money to collect minerals, that is about all they will think necessary.

Little attention is paid to the mining industry by the State or its officials. The miners themselves are apathetic. There is no miners' association to further their interests. We fear that an attempt to make a collection of minerals will not succeed as well as in former years. The miners are tired of contributing. Moreover, a whole lot of men would have to be paid to attend to it, and money would be spent that it is not necessary to spend.

The whole object of the PRESS in this matter was to see the mining industry of California well represented. It does not care to enter into any controversy on the subject, as we have seen enough of the results of that in connection with the Horticultural Bureau. If anybody has any better suggestion to make, we shall be glad to second it, but one involving the expenditure of \$50,000 or so for something we already have, is not a better suggestion for the mining interests, though it might be for the interests of those who would get the money for making the collections.

Tin Plate.

On Wednesday (July 1st) of this week the increased tariff on tin plate under the "McKinley Bill" went into effect, the duty now being \$2.20 per 100 pounds instead of \$1. So far as observable the increased rate has had no visible effect, it apparently having been previously discounted by an advance in the demand markets under a large increased call for plate from the United States. The increased buying by this country does not appear to have been done so much by canners and regular dealers as it was by speculators. What the effects of the latter's holdings will have on the market is an open question, but it is an undeniable fact that all such have, heretofore, been an incubus, and hung as a weight upon the market.

Iron Age says that British makers have, since the period of heavy buying of plates for American account prompted by the passage of the McKinley Tariff bill, reaped enormous profits and worked their mills to the utmost capacity. Having supplied the exceptional demand, a curtailment of production has taken place, and surplus supplies at factories and shipping ports are now considerably below the average amount. But, notwithstanding the closing down for a month of 44 tinplate manufacturing plants, prices have fallen in the English markets. This is accepted as proof positive that when the factories start up again the output will be so largely in excess of the demand that prices must necessarily recede in England to old figures—below \$5 a box. The largest consumer, Pacific Can Factory, in this city is acting upon the belief that the English market will fall so as to uncover the increased tariff. This company has already entered into contracts abroad for tin plate to meet their 1892 requirements, the duties on which will aggregate fully \$500,000.

Latest official statistical data of the movement of tin plate are as follows: During the year 1889 a total of about 5,650,000 boxes of tin plate were shipped from Great Britain to the United States, and in the following year 5,300,000 boxes were sent to this country. It is generally admitted that the supply on hand here, Dec. 31, 1890, was comparatively small.

It is, therefore, a reasonable deduction from the data submitted, that the average consumption of tin plate in the United States during the two years quoted was more rather than less, than 5,000,000 boxes per annum. Shipments to this country from Jan. 1 to May 30, 1891, amounted to about 3,475,000 boxes. During the first half of June, about 450,000 boxes were sent, which completes shipments that can reach here before July 1. This movement is far above the average for the corresponding period of previous years, exceeding that of 1890 by 1,617,000 boxes and that of 1889 by 809,000 boxes.

Should the production of plate in this country gain the rapid strides that the manufacture of other steel and iron has in recent years, the foreign markets need not be so much depended upon in the future.

With the adoption of modern appliances and improvements, the record of the steel rail industry may be repeated, or even excelled. It is patent, however, that the foreign sources of supply will have to be relied upon for some time to come. Out of, say, 5,000,000 boxes of tin plate consumed annually in this country about 1,750,000 boxes go into the manufacture of packages for goods that are sold in foreign markets, upon which a rebate of 90 per cent of the original duty is paid by the Government to the packers of the goods. There thus remain about 3,250,000 boxes, which represent, approximately, the amount that American manufacturers can reasonably calculate upon having a chance to compete for, and it will doubtless be some time before they get into position to turn out that quantity.

THE principal sources of aluminum have heretofore been cryolite from Greenland and imported bauxite, but recently, discoveries of bauxite have been made in Arkansas, which will no doubt lead to the extensive use of the domestic article.

FORTY-THREE mineral-producing counties in Georgia, Alabama and Tennessee, in a convention of more than 100 delegates held at Chattanooga, Tenn., have decided to make a tri-state exhibit at the World's Fair.

We Shall Be Obligated.

The publishers of the PRESS would consider it a favor for subscribers to renew their subscriptions during the coming month. Many of those whose subscriptions have expired, or are about to, would probably not inconvenience themselves but would oblige us by promptness in sending in the money. A settlement of this kind from several hundred readers is of material assistance on occasion though the amount may be small from each. The price of the PRESS is sufficiently small so it should be little trouble for our subscribers to answer this appeal.

Extracting Gold and Silver.

A patent has just been obtained through the MINING AND SCIENTIFIC Patent Agency for extracting gold and silver from ores, by Louis M. Howe of Greenwood and Lewis A. Gates of San Francisco (assignors to Henry J. Postel, this city). The patent covers a method of forcing the ore through a bath of molten or liquid metal. There is an exterior chamber to the apparatus, made of brick or other suitable material and adapted to contain a melted or liquid metal which will take up and separate the precious metals from the ore. A vertical shaft extends from top to bottom through this chamber, and has stirrers at its lower end, arranged so that two sets of stirrers rotate in opposite directions to agitate the pulverized ore.

Across the chamber are three sets of perforated disks, and beneath each set is another disk having perforations to correspond with the fixed ones. These may be turned so as to close or open the holes, the two working with relation to each other like an ordinary circular damper. There are, as stated, three sets of these. Above the upper perforated plate is a large chamber, forming the upper part of the cylinder and having a discharge opening out of one side.

Passages opening into the top of the cylinder serve to admit a strong blast of heated air, the object of which will be described hereafter.

Upon one side of the chamber is formed a circular chamber standing in a vertical plane, and having its lower portion opening into the bottom of the chamber by a passage. Within this vertically arranged chamber is journaled a wheel. The periphery of this wheel is formed into an inclined chamber which extends all the way round forming a sort of double rim into which the ore is fed from above by a screw or worm. The rotation of the wheel carries the ore down beneath the surface of the molten metal and delivers it into the lower part of the main chamber where the melted metal is kept. A peculiar scraper causes the ore to be discharged from the carrying wheel into the metal. Here it is agitated by the stirrers and caused to gradually rise up through the metal and through the openings in the perforated plates or disks. When the ore finally rises through the upper set of disks above the surface of the metal, it is subjected to a strong blast of superheated air which separates any of the liquid metal from the ore and prevents its being carried off with the ore. The fine dust of the ore, which by this time has been separated from the precious metals, will be discharged through the opening by reason of the blast, and the operation of the apparatus will thus be continuous. The perforated disks prevent the ore rising too rapidly through the metal, and it may be kept the proper length of time in the bath of metal.

THE MINT AND SILVER.—There were 45 employees discharged from the U. S. Branch Mint in this city on Tuesday, mainly from the Coiner's and Adjuster's departments. The reason for the wholesale discharge was announced to be Secretary Foster's determination to cease the coinage of standard dollars, at least temporarily. The law gave him the option of coining or not, as he saw expedient, on and after July 1st. He exercised his discretionary power by declining to continue coining, with an important exception. He decided to coin only as much as would cover an amount of trade-dollar bullion on hand amounting to \$5,000,000. None of that bullion is on this coast, so the force here had to be reduced one-fifth. This action, of course, interferes in no way with the purchase of silver, which will, as usual, continue from month to month. It was stated by a gentleman connected with the Mint that the coinage of dollars will in all probability be resumed on the first of next year.

Washington.

Perhaps we cannot more pointedly bring to the minds of our readers thoughts appropriate to the reoccurrence of the nation's birthday than by presenting the impressive view of the Washington monument which appears upon this page. This grand structure is to perpetuate the memory of Washington, and the memory of Washington is more than the recollection of a great historic individual; it includes a con-

July 4, the greatest monument to Washington, the greatest monument ever raised to the memory of any man, the highest enduring structure in the world.

The foundations of the Washington monument were laid Feb. 28, 1848, and it was completed and dedicated Feb. 22, 1885. It is a hollow shaft of granite, faced on the outside with blocks of white marble, 555 feet high. A comparison with the other noted artificial elevations of the world will readily convey to the

within the monument. The States of the Union, and in many instances cities, as well as numerous foreign countries, are represented in the obelisk, and California contributed a memorial stone. In 1852, the California stone was hewn out of a quarry of the finest variegated marble at Ringold, El Dorado county, Cal., under the direction of John Bigler and Col. John F. Hall, and brought to Sacramento with an ox team. It was shipped to Washington under direct supervision of Gov. Bigler.

Tuscarora, Nevada.

(Continued from page 1)

Adjoining Tuscarora are some fertile valleys. Most of the ranchers, however, devote themselves to stock raising, as the foothills afford good pasturage. Of course, one must have enough land under fence to put up hay in case of a hard winter.

The winter of '89 was very severe, and those who were not prepared with shelter and feed for their herds, suffered heavy losses. The snow lay to the depth of four feet on the level for five months, and it was distressing to see the poor dumb animals starving and freezing.

That was an exceptionally severe winter. The spring following, the remains of several sheep herders and mail carriers were found. They had evidently perished in some of the blizzards.

The nearest railroad is at Ely, the county seat, a distance of 50 miles. About 15 miles from Tuscarora are the famous mud springs, which are frequented in summer by many invalids. The little basin in which they are located is surrounded by four almost perpendicular cliffs on the top of which the lizard and horned toad bask in the hot sun.

Adjoining these springs is Snow Canyon, noted for its beautiful waterfall which gushes with a tremendous roar from the mountain side. The land on which this water has its outlet is very valuable, and was in litigation for many years, but the contestants being members of each sex, the difficulty was compromised by a nuptial knot.

The Flood in the Desert.

On Saturday last a portion of the Colorado desert commenced to fill up with water, and the low place where the salt mines are, is now a lake which is daily extending in size. This portion of the desert is below the level of the sea. The water doubtless comes from the overflow of the Colorado river, which has filled the old "sink" of the desert so full that the water has forced its way through the sound into the lower basin at Salton where the mines are. An engineering party has been sent out by the Southern Pacific Co. to investigate the matter, as, if the rise in the water continues, the tracks may be reached. Evaporation is, however, very rapid in that region. The water is supposed to have come through a break in the Colorado river at Pilot Knob, some 15 miles below Yuma.

The Colorado river carries an enormous body of sediment from the upper country, and of this sediment it has built a great delta at its mouth in such a manner as to cut off the upper portion of the gulf by a great alluvial dam, and the river has found its way by a cut-off to the gulf southward. Then the water which was in the upper basin has evaporated so that the bottom of the ancient gulf thus cut off is now below the sea level.

Whenever the Colorado is at a great flood height, as it has been lately, some of its waters are likely to find, and usually do find, their way across the delta to the north, where they flow into this low ground, which is below the level of the sea. There has been no such flood as this in the desert region since the country has been occupied by the whites.

THE FULTON IRON WORKS have obtained the contract (for \$26,500) for building a "disinfecting boat" for the use of the U. S. Marine Hospital service at this port. The boat will be 80 feet long over all, 16 feet 9 inches beam, and 5 feet 9 inches draft. The system of disinfecting vessels will be the same as pursued by the "Holt" Board of Health, consisting of the purification of ship and effects by the use of bichloride of mercury solution, heat and sulphur dioxide gas. A ship can be disinfected in a few hours. When completed, the boat will be stationed at the quarantine hospital wharf at Angel island, where steam will at all times be kept up. When not in use fumigating, she will be utilized in carrying passengers to and from the quarantine station and the city, and for the pleasure of patients at the hospital.

THE Kimberley diamond mines, South Africa, are curtailing production, and the price of these gems is expected to advance materially.

THE product of aluminum for the census year 1889, was 47,468 pounds, including aluminum alloys valued at \$97,335.



THE WASHINGTON MONUMENT AT THE NATIONAL CAPITAL.

ception of the thoughts and acts which made him great, and of the principles which underlie our existence as a nation, and truth to which will insure our future. Washington has become to us more than a man; even more than a statesman, a warrior, a patriot. Washington stands the ideal American, endowed with every truth, nobility and virtue which the human mind can conceive embodied in human life, consequently to speak his name in the fullness of its significance is to bring to mind all we are as a nation and all we hope to be.

Therefore, we chose as our leading illustration in this issue, which bears the honored date

reader the wonderful dimensions of the monument. The nine highest in the world are as follows: First, the Washington monument, 555 feet; second, the Cologne Cathedral, 510 feet; third, the great Pyramid of Cheops, 480 feet; fourth, St. Peter's Church at Rome, 448 feet; fifth, St. Paul's Church, London, 360 feet; sixth, St. Mark's Church at Venice; seventh, the Capitol at Washington, 283 feet; eighth, the Brooklyn Bridge Tower, 276 feet; ninth, Trinity Church, New York, 263 feet.

The apex is a pyramid of white marble, topped with metal and a lightning rod. The dizzy height may be reached by an elevator

In the west wall of the monument, just above the platform, at the height of about 150 feet from the base of the shaft, and easily seen, is a stone bearing the following inscription in sunken letters:

California,
The youngest sister of the Union,
Presents this Golden Tribute to the
Memory of its father.

There was another stone, prepared in 1860 by the miners of Columbia, Tuolumne county, which was shipped by sailing vessel. The ship made a quick trip, but was sunk just before reaching New York. The miners' stone never reached the monument, but lies on the bottom of the Atlantic.

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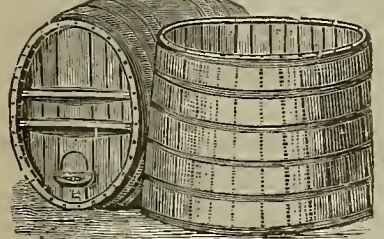
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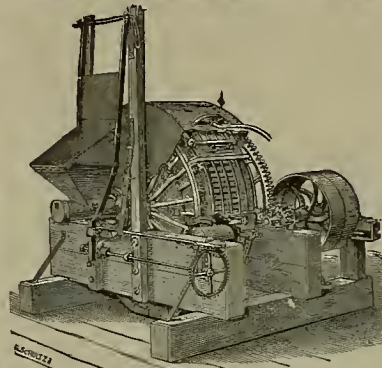
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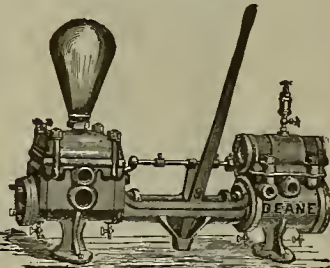
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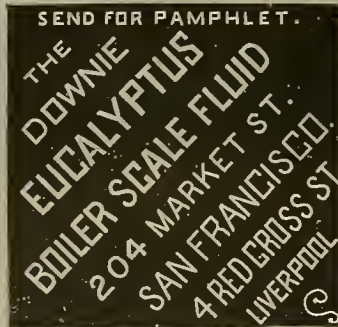
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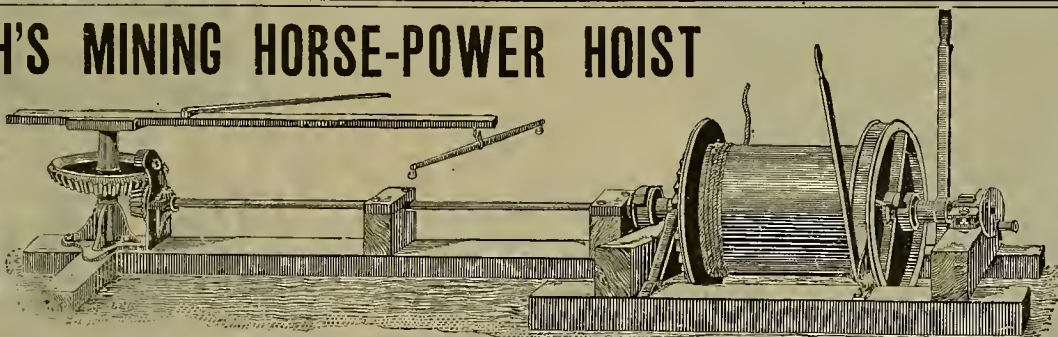
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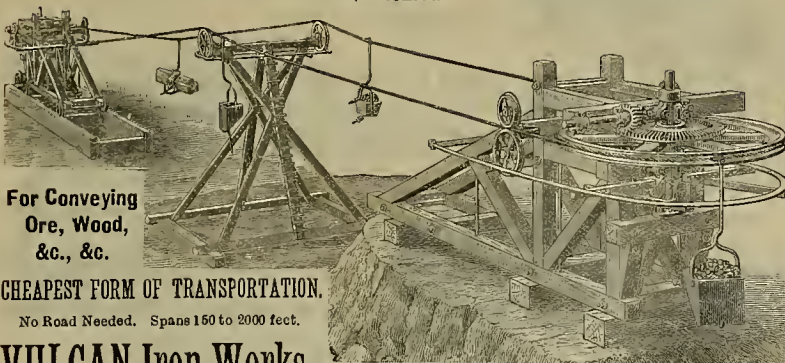
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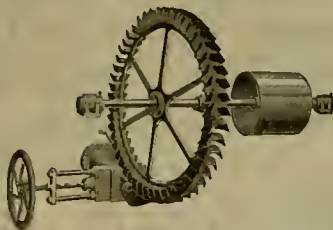
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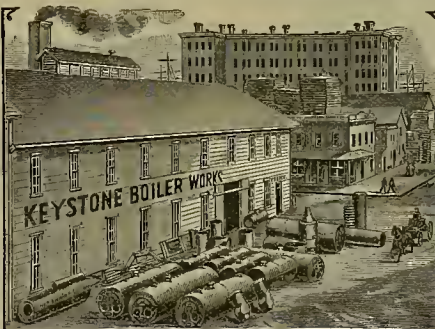
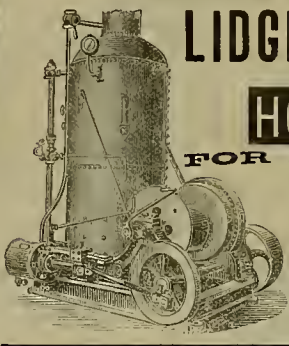
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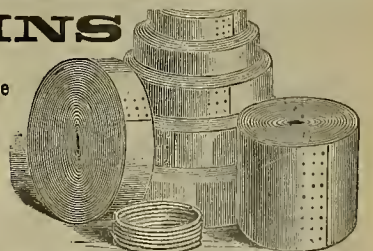
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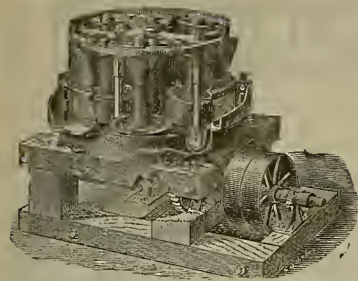
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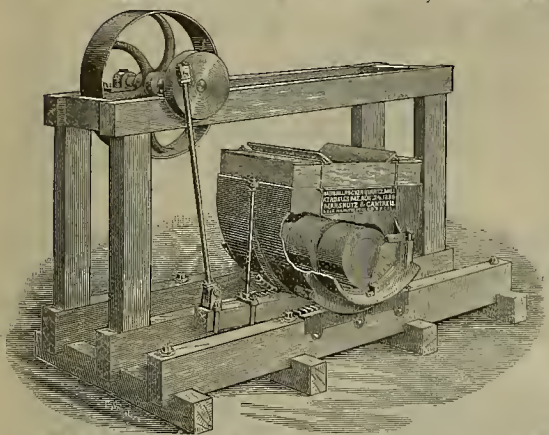
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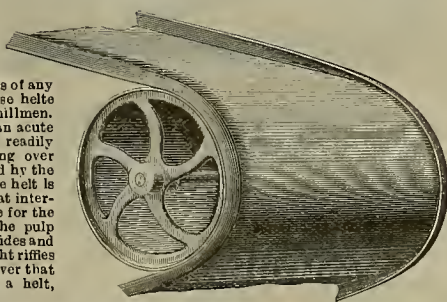
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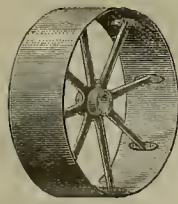
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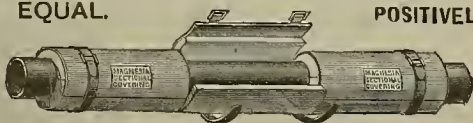
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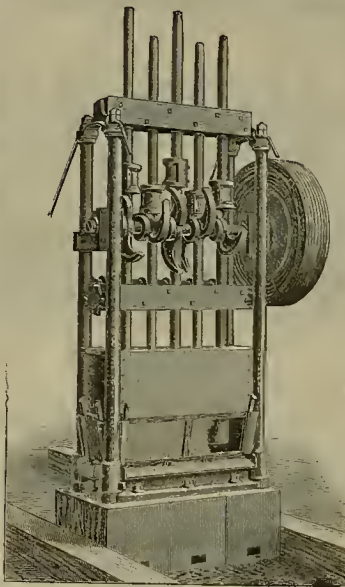
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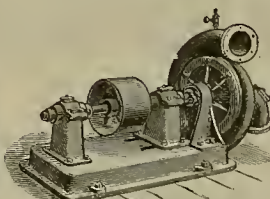
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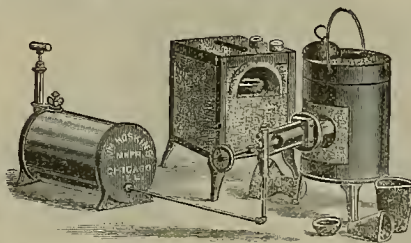
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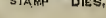
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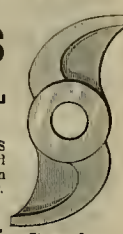
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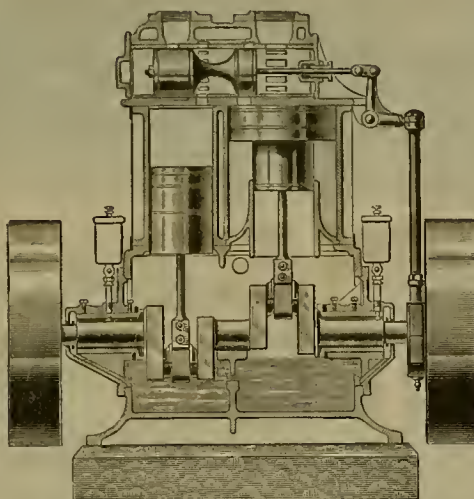
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GREATEST CAPACITY OF ANY CONCENTRATOR MADE,

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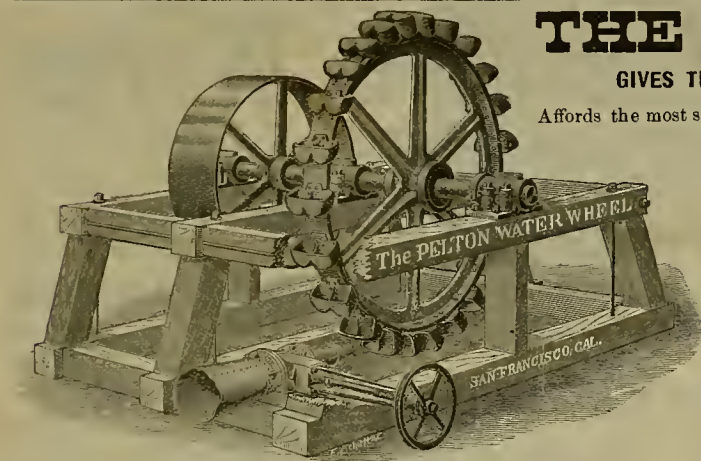
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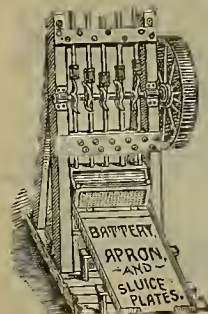
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RECEIVED EVERY MEDAL Awarded on the Pacific Coast for Silver-Plated Amalgam Plates and Best Gold, Silver and Nickel Plating.

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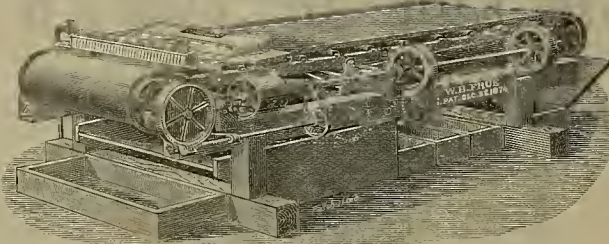
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



PROTECTED BY PATENTS—September 2, 1879;

April 27, 1880; March 22, 1881; February 20,

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Patents applied for.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

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Mining and Milling Machinery, Engines and Boilers,

SHEET-IRON WATER PIPE for Mining and Irrigation Purposes.

Exclusive Agents for the Pacific Coast of HEINE PATENT SAFETY BOILER, MACBETH STEEL PULLEY and COMMON SENSE STEEL WHIM.

AGENTS FOR THE PACIFIC COAST OF

Bryan's Roller Quartz Mill.

WE HAVE ON HAND AND FOR SALE CHEAP

A 50 H. P. PUMPING PLANT, CONSISTING OF

One 10" x 30" Corliss Engine; all pump gears; bob irons; connecting rods.

One (1) 6" x 6" Plunger Pump.

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One (1) Complete Outfit for a 2½-ton capacity chlorination Works.

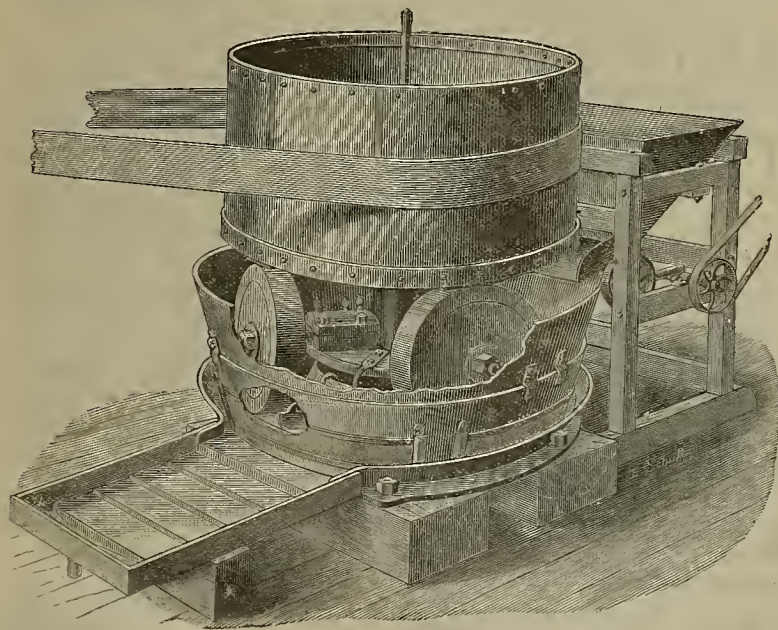
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One (1) 10" x 18" Slide Valve Engine.



LEVIATHAN COTTON BELTING.

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MINING AND QUARRYING

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MINING AND SCIENTIFIC PRESS.



An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 2.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, JULY 11, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Hauling Sagebrush.

The sagebrush, which is so abundant in certain portions of this coast, is used for fuel where larger wood is scarce, and it would be difficult to get along without it in many mining camps, especially in Nevada. The cut on this page shows one of the teams hauling this brush to the quartz mills. A correspondent furnishes us the following information.

"The handling of sagebrush has proved a remunerative business in Tuscarora, Nevada. As it is impossible to get wood enough to supply the mines, the brush is substituted."

"In early days it was cut within half a mile of town and sold at \$2.50 per cord; since it became necessary to haul it 10 and 15 miles it has advanced in price. Generally a man takes a contract to furnish a certain quantity, and as soon as the weather permits, he takes a crew of Mongolians equipped for the season. After the brush is cut and trimmed, it is loaded on the wagons something in the fashion of hay. Three wagons comprise a load for seven span of horses. After being hauled to the mills or mines, it is measured. After this, all the ropes are untied and some of the horses are transferred to the side of the wagon; then the driver tells his men to 'stand clear.' He then cracks his whip and the wagon is turned on its side and the brush is dumped."

An Electric Locomotive.

Among the numerous electrical appliances for mining purposes, manufactured by the Edison General Electric Co. of New York, is the mining locomotive, shown in the cut on this page. As will be seen, it is a very compact piece of mechanism, strongly built and intended especially for tunnel and other underground work. Now that electric power is being so rapidly utilized in mining operations, this machine will doubtless more rapidly come into use, doing away with horse and man power in pushing the cars underground. Of course, there is great advantage in this, as it admits of rapid handling of material and furnishes all the power necessary. In the long tunnels in the gravel mines of this State these electric locomotives ought to be adopted, especially where there is water power within a few miles to furnish power for generating the electric current.

The South Homestake mine, White Oaks, N. M., caught fire, last week, and two miners, E. Timoney and George Drake were suffocated.



HAULING SAGEBRUSH, TUSCARORA, NEV.

The Tulloch Concentrator.

The sulphuret concentrator invented by James Tulloch of Sonora, Tuolumne Co., has recently been improved and is now being manufactured in this city by the Risdon Iron Works. As the engraving shows, the machine consists of a rocking frame, which supports a drum on each end, intermediate rollers, a belt, and gear wheels on the ends of the highest drum, together with ratchet wheels and pawls, the pawls being hinged to the outside stationary frame. The concentrator is operated by two eccentric rods, issuing from the outside stationary frame and connecting with the rocking frame at both of its ends. A movement of one or two inches of these rods causes the rocking frame and all attendant parts to oscillate from side to side, gently, but positively, and wash the sand to the lower end of the belt, while the sulphurets, by their specific gravities, gravitate and adhere to it, until reaching a water trough underneath the large drum, they are deposited. In conjunction with the lateral motion of the belt, a quick, sudden motion is communicated to it by the ratchet wheels on each end of the large drum, engaging the pawls by contact with

them as the frame rocks from side to side. The frame is provided with cast iron grooved rockers, which rest on plates secured to the frame.

California Mining Machinery.

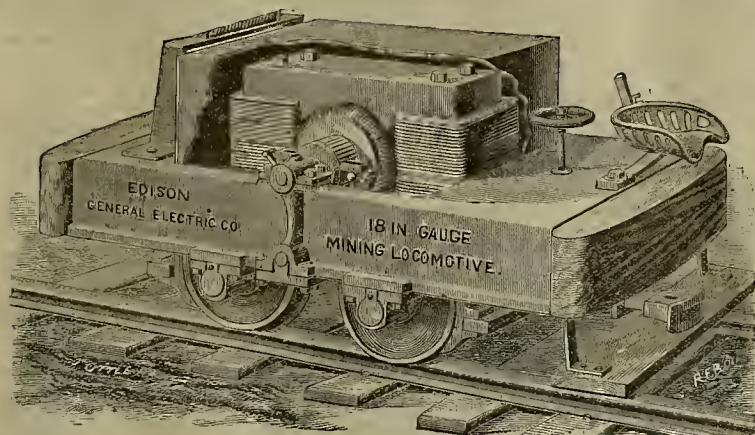
Our State Commissioners should make an effort to collect for the Chicago World's Fair types of all the mining machinery for which California is famous. Most of the appliances for both the gold and silver mills in common use in this country originated in this State, because it was here that for many years all the Pacific States and Territories came for their machinery. In amalgamators, pans, settlers, ore-feeders, concentrators, furnaces, rock-breakers, ore-pulverizers, etc., there have been countless inventions made here. It would be a good thing for those who have the mining division in charge to see that all these types are brought together at Chicago.

Many of the inventors have models of their machines, and in other cases full-sized machines could be taken. The inventors themselves would no doubt gladly aid in this matter, and the result would be an exceedingly instructive display. The State Mining Bureau has never made any attempt to get the mining inventions of California, and has few models or machines. But the World's Fair Commission could do this with little trouble, and this collection, added to that of the minerals, would redound to the credit of the State.

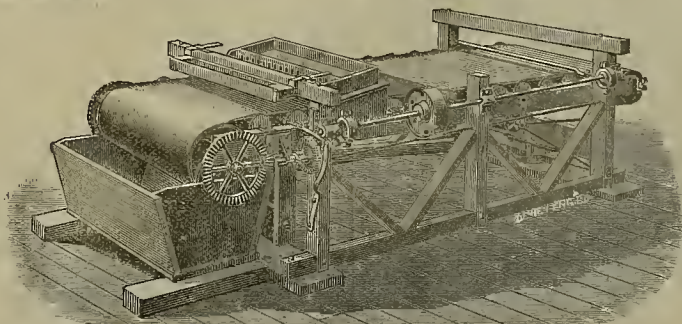
Nearly all the appliances of hydraulic mining, such as the monitors, undercurrents, derricks, gravel elevators, etc., originated here, as did the system. There are many inventions of importance in this connection which could be made into a separate display. Then those related to quartz mining and milling could also be grouped. The miners of this country could be brought to a realizing sense of what they owe to the California miner and inventor for appliances they have in every-day use. It is greatly to be hoped that the Commission will at once begin to take steps in the direction of the mining display and prepare for exhibiting not only the minerals of the State, but the mechanical appliances which originated or were brought to perfection in California.

THE Mineral Palace at Pueblo, Colo., was opened on the 5th inst. An immense and valuable collection of minerals is displayed, and there are mine models, machinery, etc. San Juan and Pitkin counties have the most complete exhibits of the mining counties of the State. The building cost about \$150,000, and is especially devoted to the mining industry.

LEAD ORES.—The census gives the following as a result of the investigation into the product of lead ores: Colorado, 70,788 short tons; Idaho, 23,172 short tons; Utah, 16,675 short tons; Montana, 10,138 short tons; Arizona, 31,158; Missouri, 44,482.



ELECTRIC MINING LOCOMOTIVE.



TULLOCH'S IMPROVED CONCENTRATOR.

Overloaded Mining Companies.

A growing disposition is being shown by those who are interested in our undeveloped mining properties, to offer English speculators an opportunity of sharing the good things that we enjoy in this highly favored land. We know that this tendency is not due to any special overflow of the springs of human kindness or to any outburst of generosity on the part of the local people. Moreover, we fear, that the ruling motive in these cases is not so much a laudable desire to develop the Australian mining industry and at the same time afford the English shareholder a profitable investment, as a wish to bring the golden shekels in goodly numbers into the gaping pockets of the vendors. The flotation of properties on the London market affords an easy means of raising capital and at the same time securing a far higher price to the owners of the property than could be obtained on the spot, and no one could raise the slightest complaint so long as the enterprises to be embarked in are genuine and the price which the English shareholders are called upon to pay for their interest is not excessively high. It has, we are sorry to say, happened in the cases of a number of companies floated, not only in London, but also in the colonies, that the properties have been shamefully overvalued by the enormous sums asked for by the vendors, and the exaggerated estimate put forward as to the value of the mine has in numberless instances brought ruin to the shareholders and profit to none but those who were shrewd or fortunate enough to secure a share of the solid cash forming part of the purchase money. It is not necessary in this article to point to instances of this sort, as no doubt any one of our readers could call to mind scores of cases which will fairly answer to the description we have given. What we are anxious to do at the present stage is to sound a note of warning against pursuing this sort of policy too far, and to express our conviction that, unless great care is exercised in appraising London speculators, those who are seeking assistance will find that they have overshot the mark and that the ears that once listened eagerly to the glowing stories of Australian mineral riches are now cold and unsympathetic. We feel certain that, except perhaps in a few specially favored cases, English speculators will fight shy of ventures in which enormous prices have to be paid for mines, which, although possibly of high prospective value, offer no immediate tangible security.

We must remember that we are not the only people in the outlying parts of the world who have mines, surrounded by all the attractive glamor that attaches to the comparatively unknown, to offer to the home speculator. British men of money have lately been led a pretty dance by some of the more enterprising and unscrupulous spirits connected with the South African gold-fields, and the bitter experience gained in these and other unprofitable speculations has not gone for nothing. Further than this, it must be borne in mind that our own record in the English mining market is not too good, and that with fresh fields of enterprise opening up on several hands, notably in Canada, and possibly also in the much talked of Mashonaland, the British public are not likely to bite too greedily at the alluring baits held out in the guise of Australian mines. We are strengthened in this view by the advice sent out recently by our London correspondent to the effect that while there has been no falling off in the enterprise displayed in the London mining market a much more cautious spirit prevails, and closer enquiries are being made by investors than formerly; that although the days of wild and indiscriminate speculation are perhaps not quite gone, they are rapidly drawing to a close.

Any legitimate enterprise in which the London public are asked to participate on fair terms is not likely to be prejudiced by this change of attitude, but on the contrary, the more perfect the check placed upon wild cat flotations and unduly inflated estimates of property values, the better will be the prospects of success with genuine proposals. The history of Australian mining furnishes scores of cases during the last few years in which properties have been floated into companies, and overloaded to such an extent by the exorbitant requirements of those who, to use a common phrase, have "got in on the ground floor" that all the glowing prospects presented to a too confiding public would have to be more than realized before dividends could come within the range of possibility. Many companies have been floated with enormous capitals, of which only a fractional part has been left available for legitimate expenditure after the vendors of the mine have been paid, and the brokers and middlemen employed in the launching operations have had their pickings. Nothing short of phenomenal good fortune could place such mines, overloaded as they have been, on a sound dividend-paying footing, and the investing public, both here and at home, are becoming more and more jealous of the diversion of large proportions of their cash contribution from the work of legitimate development into the pockets of a few favored individuals. The high estimates placed upon some of these properties by greedy vendors may be based upon their honest opinion of value, but they nevertheless still further minimize the already too slender chances of making the investment profitable to the shareholders. The English speculator knows this well enough,

and as he does not pay his money for the fun of the thing, but in the hope of getting good solid dividends, he is likely to look askance at any proposal which fails to offer reasonable security that the bulk of his money will be devoted to real honest mining work.—*Australian Mining Standard*.

Amador County Marble.

The Amador Ledger says: Last Monday, in company with S. G. Spagnoli, L. J. Fontenrose and S. N. Spagnoli, we visited the quarry of the Carrara Marble Company. It is located on Sutter creek, almost due north of Pine Grove, and by the wagon road is 12 miles from Jackson. The new road constructed by the company leaves the main county road about a mile west of Pine Grove, and winding around considerably reaches the quarry in four miles. The grade in no place is steeper than on the public roads. It is soft in places, and also narrow, but with all defects it is a good serviceable thoroughfare. The quarry is located in a wild region, the steep hillsides being thickly covered with young timber and underbrush. The point where they have commenced operations is nearly midway up the hill—fully 200 feet above the creek bed. This was selected because it was easier to open at this point, and also because it involved an easier grade for the roadway on the south side of the creek than if work were started nearer the bottom. It also secures ample dumping room for waste material, thousands of tons already covering the hillsides below the quarry. There were ten men at work, most of them being employed in squaring the blocks—an operation which requires considerable time. Over 100 tons have already been shipped or prepared for shipment, but the face of the deposit is hardly touched. It is a mountain of marble; the width has been measured for 120 feet, and will probably prove greater when the earth is stripped from the face.

The supply is practically inexhaustible. Where the stone crops out from the hillside it is considerably broken with fissures and cracks, but it is expected that as it is opened up it will become solid and compact, and also that the grain will become finer. In the rough it is impossible for a novice to form a correct idea of the marble as it appears when polished. Messrs. Bald and Riot, who have had long experience in marble of all kinds, domestic and foreign, say the stone from this quarry is better than any other on the coast. It is not so hard and flinty as the Inyo marble, and consequently is not so expensive to work. There were 9 or 10 blocks awaiting shipment, of various sizes. The largest was eight feet long, four feet wide and three feet thick, and weighed in the neighborhood of eight tons. It contained 120 cubic feet and was worth in the rough, delivered in San Francisco, \$300. There are four or five teams engaged in hauling to Lone. One of the largest blocks yet shipped was hauled Monday by Prouty's team. It weighed 90 hundred-weight.

The outlook is favorable for a thriving business in marble from this quarry. It is being used for pavement at the Stanford University, and this will be not only a first-class advertisement, but also a good test of its durable qualities.

Recent Additions to the State Mining Bureau.

Quicksilver ore, near Berryman Station; A. V. Tuohy.
Gold in Bismutite, Dos Cabezas, Cochise Co., Arizona; Mr. Patterson.
Tin ore, Deer Lodge, Montana; F. W. Trap-hagen.
Calcite (carb. cal.), Bierigg mine, Egremont, Cumberland, England; Williamsburg Sci. Society.
Opal (common), Guaoajuato, Mexico, Williamsburg Sci. Society.
Mallockite (oxychloride of lead), Cromford, Derbyshire, England.
Schwartzengbergite (oxychloride and iodide of lead), Chile.
Polycrase (rich in scandium), Marietta, Greenville Co., South Carolina.
Garnet, Pink (with vesuvianite), Morelos, Mexico.
Coloradoite (telluride of mercury), Smuggler mine, Boulder Co., Col.
Leucite (silicate of aluminum and potassium), Magnet Cove, Arkansas.
Willemite (silicate of zinc), Franklin Furnace, Sussex Co., N. J.
Monticellite (silicate of calcium and magnesium), Magnet Cove, Arkansas.
Herrengründite (hydrous sulphate of copper), Herrengründite, Hungary.
Diabase, Weldo, Kern Co., Cal.; C. J. E. Taylor.
Gypsum (hyd. sulph. calc), var. alabaster, occurs in large quantities in the Cuyama Val., San Luis Obispo Co., Cal.; Myron Angel.
Asphaltum, occurs in quantity in the Cuyama Val., San Luis Obispo Co., Cal.; Myron Angel.
Sandstone (impregnated with petroleum), Petrolia, Humboldt Co., Cal.; A. McGregor.
Auriferous vein matter (rich in gold), Hematite, Rose mine, San Bernardino Co., Cal.; G. W. Woodworth.
Laumontite, Cucamonga canyon, San Bernardino Co., Cal.; H. Sontag.
Fossils (from oil rocks), Ventura Co., Cal.
Gold quartz, Venus mine, Campo Seco, Calaveras Co., Cal.; A. B. Summers.
Calcite (carb. cal.), Melbourne, Victoria; Fred. Danvers Power. Also 35 mineral specimens of various kinds, including auriferous gossao and other gold bearing ores, asbestos, stibnite, kerosene shale, amazon stone, cassiterite (in gressee), stream tin, etc., from the different Australian Provinces.

The Stanford University.

The Leland Stanford Junior University has announced the arrangement of the courses of instruction and the list of professors and studies.

The appointments of members of the faculty so far made are David Starr Jordan, formerly of Indiana University, President; Andrew Dickson White, ex-Minister to Germany, non-resident Professor of European History (resident in March, April, May); George Elliott Howard, formerly with the University of Nebraska, Professor of American History and the History of Institutions; John Casper Branner, formerly of the University of Indiana, Professor of Geology (work to begin in 1892); Oliver Peebles Jenkins, formerly of the Panu University, Professor of Physiology and Histology; John Henry Comstock, formerly of Cornell University, non-resident Professor of Entomology (resident in January, February and March); Melville Best Anderson, formerly of the State University of Iowa, Professor of English literature; John Mason Stillman, formerly of the University of California, Professor of Industrial and Inorganic Chemistry (work to begin in 1892); Ferdinand Sanford, formerly of Lake Forest University, Professor of Physics; Henry Alfred Todd, formerly of Johns Hopkins University, Professor of the Romance Languages (work to begin in February, 1892); Charles David Marx, formerly of the University of Wisconsin, Professor of Civil Engineering; Joseph Swain, formerly of Indiana University, Professor of Mathematics; Ernest Mondell Pease, formerly of Bowdoin College, Professor of the Latin Language and Literature; Horace Bigelow Gale, formerly of Washington University, St. Louis, Professor of Mechanical Engineering; Charles Henry Gilhert, formerly of Indiana University, Professor of Vertebrate Zoology; Douglas Houghton Campbell, formerly of Indiana University, Professor of Cryptogamic Botany; Earl Barnes, formerly of Indiana University, Professor of the History and Art of Education; Edwin Hamlin Woodruff of Florence, Italy, Librarian; James Owen Griffin, formerly of Cornell University, Assistant Professor of German; George Mann Richardson, formerly of Lehigh University, Assistant Professor of Inorganic Chemistry; Arthur Gordon Leird, formerly of Cornell University, Instructor in Greek; Orrin Leslie Elliott, formerly of Cornell University, President's Secretary and Registrar and Acting Instructor in Economics; Louis Alexander Buchanan, formerly of the St. Louis Polytechnic Evening School, Foreman of the Wood-working Shop; Daniel Kirkwood, formerly of Indiana University, Non-Resident Lecturer on Astronomy (resident in May); Jacob Gould Schurman, formerly of Cornell University, Non-Resident Lecturer on Ethics (resident in March).

Mechanical and Mining Engineering.

The course of instruction perhaps most completely arranged is that in mechanical engineering. Four years' work is outlined, and by the time the student finishes it he ought to be able to thoroughly understand the construction of everything from a steam pump to an underground electric cable and conduit.

In the first year, those ambitious to be mechanical engineers will get a splendid chance at advanced mathematics and English composition, and work in the physical laboratory and the shop. In the second year, they will get more of mathematics, more of physics, and will study machines where machines are made. The third year's feature will be studies in analytic and applied mechanics, chemistry and drawing, with options and elective studies in mechanical engineering. The last year will be given up to elective studies in mechanical engineering. The aim in this course will be to turn out thoroughly practical men.

The course in civil engineering has been arranged with the same end in view. The students will have a chance at railroad engineering, land surveying, bridge work and surveying for sewerage and pavements, and will be obliged to take the collateral work that belongs to such a course.

The work in mining engineering will not be begun before the second year. First-year students in the department will be taken through that year's work in civil engineering with the courses in elemental geology.

Studies in Geology.

The work in geology will not be begun until the second term, and will consist first, in elemental geology, in lectures on dynamic and structural geology; second, in topographic geology, in field and office work in topography, and third, in paleontology in lectures and laboratory practice in identifying fossils.

The work in zoology will comprise laboratory studies of the typical forms of animals and systematic zoology. The comparative anatomy of the vertebrates will be studied in the laboratory, and there will be an advanced course in systematic ichthyology, and a course of lectures on the laws of organic life.

Physiology and histology will be taught in a similar way. There will be elementary and special courses, students preparing for medicine being advised to take physiology as a major subject in chemistry, botany and zoology.

Instruction in entomology will be given during January, February and March, and will be in the form of lectures, together with laboratory and field work. There will be four courses in

botany, each arranged for five hours' work a week.

The work in chemistry is planned to be done almost altogether in the laboratory. For instance, in elementary chemistry, lectures are three hours a week and laboratory work daily. In this, as in most of the other studies, work will be arranged to meet the needs of individual students.

In the other studies, Greek, Latin, German, the Romance languages, English literature, philosophy, history, economics, mathematics and physics, the courses of study are arranged much as in other modern universities, and it is explained that the announcement for 1891-92 is largely tentative and subject to such modification as the needs of the students may require.

There is a course on the history and art of education, and teachers not candidates for a degree will be given every facility for carrying on special studies in the department.

Mining Stocks on Margins.

The Supreme Court of this State has again furnished local mining speculators with a fruitful theme for discussion. It has denied the petition for a rehearing in the case of Cushman vs. Root.

This petition was presented by the prominent law firm of Garber, Boalt & Bishop as amici curiae on behalf of the San Francisco Stock Exchange, who are interested to a great extent in the final decision of the case.

The facts of the case and the points on which the rehearing was asked were presented by Mr. Garber.

Counsel argued that under the decision as it now stands no one can safely make an investment in the shares of any corporation or association, no matter how profitable it may be, unless he has all the money on hand required to make the purchase. The savings accumulated by labor cannot be utilized for a first payment, relying upon future savings to make up the full amount necessary, nor can the investor induce another who happens to have money on hand to advance him the money, less such payment as he is able to make at the time, retaining the stock as a pledge and security for the money so advanced.

It is claimed that Section 26 of Article IV of the Constitution, under which the suit was brought, only applies to time contracts. The important clause is: "All contracts for the sale of shares of the capital stock of any corporation or association on margin or to be delivered at a future day shall be void."

In this case it was contended that there was no sale of shares on margin to correspond with the alleged purchase of shares on margin. The Constitution does not forbid the purchase of shares on margin, but forbids a sale of shares on margin. This, it was argued, is not a mere verbal distinction, but a very substantial and material difference.

People of small means are enabled to make judicious investments of their money by installments, and if such purchases were absolutely forbidden it would necessarily result in greatly embarrassing dealings universally acknowledged to be legitimate, and in many cases to retard or prevent prudent investments by those who, since they acquire their money by industry and economy, are rarely in the possession of the entire sum in cash required for such investments.

One of the intentions of the originators of the law was to prevent a person selling something which he did not have, and as to these contracts, the Constitution has performed its mission and they have substantially ceased to exist.

The precedent followed by the court was said to have been founded on some rulings of the courts in Pennsylvania and Connecticut, but the contracts under which the suits were brought there are acknowledged to have been drawn up for the purposes of gambling.

The decision of the court was rather a surprise to investors, as the ruling will apply to the most substantial investments in local as well as mining stocks, and the purchaser of 100 shares of Bank of California stock, if he has not paid for it in full, is as much in jeopardy as a buyer of West Con. Virginia seller a year.

PROGRESS OF THE SOUTH.—The *Tradesman's* report of new industries established in the Southern States during the second quarter of 1891 shows a total of 892 against 1350 for the same period the year previous. The paper says that while the number of new industries established for the second quarter of this year is not up to that of the corresponding period in 1890, still the industrial interests of this section are in a very healthy condition, and a noticeable feature for the past three months has been the amount of capital invested in enterprises. When the recent stringency in the money market is taken into consideration, the industrial activity in the South is very gratifying and justifies the assertion that no section of the country is in a more healthy condition than the Southern States.

ANOTHER CASE SETTLED.—The suit of Chas. W. Hendel against B. T. Baker was dismissed on the 21 in Judge Greene's court by agreement of both parties. The suit has been pending some time. The defendant was President of the Pioneer Mining Company, operating in Sierra county. A dispute arose over a sale of stock of the company, and Hendel demanded \$15,890 as his share.

The MacArthur-Forrest Process.

Cyanide for Gold and Silver Extraction.

[The following article, furnished to the MINING AND SCIENTIFIC PRESS by C. W. Merrill, gives the results of experiments carried on at the metallurgical laboratory of the University of California. The object of the experiments was to give the process an impartial investigation as to theory, and to look into its practicality as far as possible on a laboratory scale.—EDS. PRESS.]

The following is a brief outline of this process taken from the statement of J. S. MacArthur before the Society of Chemical Industry, as published in the journal of that body for March 31, 1890.

"The ore is ground to about the fineness of sea sand, * * * this is then mixed with a solution of cyanide. * * * The ore and solution are then stirred for about six hours. * * *

In practice the time required is determined by direct experiment. When the gold is known to have been dissolved, the pulp is discharged into an ordinary filtering tank, where the filtration may, if necessary, be assisted by suction, and where the ore is washed by water or by the waste cyanide from a previous operation. * * * On allowing the cyanide of gold solution to trickle through a mass of zinc (prepared in a form like sawdust, porous and with a large surface of bright metal,) we found that it trickled out gold-free, and better still, we found that the action became more vigorous and pronounced after a portion of the gold had been precipitated on it. * * *

When the gold has been deposited, it is necessary to separate it from the excess of zinc present. * * * The filiform mass of zinc with gold powder adhering is vigorously shaken in water, when the gold falls off and the fibrous particles of the zinc may be collected in a sieve. The gold settles easily, is collected, and fused directly into bullion."

The above was the method in its infantile outline, and below will be found a minute, detailed description of the process as it is said to be carried on at the mills of the company, or licensed by the company, at the present time. I quote from the circular of the company possessing the United States patent rights and from the description of a plant in Idaho, as described in the MINING PRESS of May 22, 1891.

The ore (usually sulphurets) is crushed dry to pass a 40 to 60 mesh screen. It is then mixed with the cyanide solution in proportions which vary from two parts by weight of ore, equal to one part by weight of solution to equal parts. The solution may be from one-eighth of one per cent to one per cent of pure KCN, according to previous experimental determination on a small scale with the given ore. The mixture is then agitated, either in revolving barrels or in ordinary pans with stirrers, for a period varying from four to eight hours, after which it is drawn into a tank provided with a false bottom for filtering. After filtration, the ore is washed either with water or with waste solution from a previous operation. The filtrate and washings are then run slowly through a filter of zinc turnings. The barren solution may then be tested volumetrically with silver nitrate for the amount of active cyanogen, and regenerated by the addition of KCN to the required strength. The gold is shaken from the zinc turnings and recovered as above described. Whenever necessary zinc turnings are added to the filter.

Now, being desirous first to see if there was anything in the process, I performed a series of experiments, using one assay ton (about 30 grms) of concentrates, sampled to 80 mesh and not acid in reaction, and 200 cubic centimeters (200 grms.) of one-half per cent solution, the proportion being, as seen, one part ore to nearly seven parts solution. These mixtures were placed in bottles and agitated in a Taylor shaker for about six hours, and then filtered through paper filters and carefully washed with a volume of water equaling the volume of solution used. The filter papers and contents were then removed and dried, the papers burned and ash mixed with the tails, which were then assayed by the ordinary crucible method. I treated thusly six ores, and the results will be clearly seen by the following table:

ORE.	Ore Assay in Ounces.	Tails Assay in Ounces.	Percent gold Extracted.
I. (a) Oregon Pyrites	13.825	15.35	13.85
(b) Oregon Pyrites	10.8	12.65	14
(c) Oregon Pyrites (1% solution)	13.85	9.97	20.4
II. Zinc Blende Concentrates	1.545	3.44	.93
III. (a) Calaveras Pyrites	5.925	32	.82
(b) Calaveras Pyrites (treated twice)	.36	10.39	33.83
(c) Calaveras Pyrites (treated twice)	.3	10.4	85.63
IV. Shasta Pyrites	15.26	11.8	2.97
V. Alaska Pyrites (treated twice)	2.355	.775	.51
VI. Alaska Pyrites (treated twice)	2.11	.58	.38

By examining the results it will be seen that the percentage of gold and silver dissolved by the solution vary from 14 to 95, and 17.5 to 85, respectively. Being satisfied by experiment a on ore III that a large amount of the solution dissolved out 86 per cent of the gold and 45

per cent of the silver, I immediately went to work to test the second step in the process; i. e., the precipitation of the gold and silver by zinc. This I did in connection with experiments b and c on the same ore (III). I treated them as I have described in the first part of the paper, except that I filtered them through sand filters and saved the tails and filtrates, introducing into the latter narrow strips of sheet zinc, which had been rolled out very thin and exposed a bright surface. The instant the zinc was put in, action commenced, the liquid became cloudy, bubbles of some gas escaped, and the zinc gradually became coated with a brown powder. In order to give this step in the process a fair trial, I allowed the zinc and solution to be in contact until no action resulted, when bright zinc was introduced. This took about 24 hours. Then, having removed the zinc, I filtered the solution, which collected any suspended particles in the filter paper. I then dissolved the zinc in dilute sulphuric acid and filtered the solution thus obtained, which contained suspended particles of gold and silver, through the same filter that I had used previously, so that I had all the gold and silver content. I thus treated the two solutions b and c of III. I now burned the filter papers carefully at a low red heat in roasting dishes and then removed the ash and contents in two scorifiers and scorified with 15 or 20 grms of test lead, cupelled and parted. I thus recovered from b, 5.22 milligrams gold, which equals 88.1 per cent of the gold content and 16.26 milligram silver, or 50.81 per cent of the silver content. From c was recovered 5.17 mg. gold, equaling 87.26 per cent, and 15.75 mg. silver, equaling 49.23 per cent. Having saved the tails, with the sand from the filter, I subjected each to a second treatment, saved the solution, and treated it as in the case of the first, and obtained from b .34 mg. of gold, equaling 5.73 per cent, and 5.65 mg. of silver, equaling 17.66 per cent; from c .45 mg. of gold, equaling 5.78 per cent, and 6.01 mg. of silver, equaling 18.78 per cent. Next assayed tails, and the results will be found in the tabulated statement below.

First sol.	Second sol.	Tails.	Totals.	Assay Value.	Per cent of Assay Value extracted.
Au. .5.22 Ag. .16.26 Per ct. 88.1	Au. .34 Ag. 5.65 Per ct. 50.81	Au. .36 Ag. 10.39 Per ct. 6.08	Au. 5.92 Ag. 32.20 Per ct. 98.91	Au. 5.925 Ag. 32 Per ct. 100	Au. 93.83 Ag. 68.47

First sol.	Second sol.	Tails.	Totals.	Assay Value.	Per cent of Assay Value extracted.
Au. .5.77 Ag. .15.75 Per ct. 87.26	Au. .45 Ag. 6.01 Per ct. 78.78	Au. .3 Ag. 6.27 Per ct. 5.06	Au. 5.92 Ag. 28.03 Per ct. 99.91	Au. 5.925 Ag. 32 Per ct. 100	Au. 94.85 Ag. 63.06

These experiments, as is easily seen, show conclusively that the zinc will precipitate all the gold and silver, if given time enough. As I see no reason why, on a practical scale, the pregnant solution cannot be made to run as slowly as desirable, the problem of the precipitation of the gold and silver, when once in solution, would seem to have been perfectly and neatly solved. This statement, however, must be modified in case the waste solution is to be regenerated. In this case, the minimum time in which the gold and silver will be precipitated must be ascertained. The zinc replaces the gold going into solution as a double cyanide of zinc and potassium. Now the amount of zinc that goes into solution varies directly with the time. The amount of cyanogen in this combination, $Zn(CN)_2 \cdot 2 KCN$, is totally inert, as regards further solvent power, as gold or silver will not replace zinc in such a combination, and only a double cyanide of a metal with an alkali is soluble. Thus it is seen that the longer the zinc and solution are in contact the less of active cyanogen (for dissolving gold and silver) will remain.

Being assured of the principle of the process and the practicality of the precipitation, I set to work to test the practicality of getting the gold and silver into solution, taking the proportions given as used in the Idaho plant, above spoken of, i. e., 2½ parts ore to 1½ parts of solution, the solution to vary in strength from one-eighth of one per cent to one per cent, as determined experimentally. For this purpose I selected three ores, i. e., the Oregon ore (which yielded in above experiments 20 per cent), the zinc blende concentrates (40 per cent), and the Calaveras sulphurets (92 per cent). I took four charges of each ore, consisting of:

Ore 1 A. T. = 30 grms. (approx.)

Solution = $30 \times \frac{1}{2} = 15$ grms. = 18 cu. cm.

Charge No. 1 was of 1%
" " " " 1%
" " " " 1%
" " " " 1%

The cyanide used showed by quantitative analysis about 50 per cent KCN, so for a 1 per cent solution would use 2 per cent by weight of the cyanide to 100 per cent by weight of water. The ore was tested as before and found neutral. Calcium Chloride was added to the solution to neutralize any hydrate that might be present (as per directions), and the mixture of ore and solution was then agitated for eight

hours. The experiments with the zinc ore gave anomalous results, which I afterward ascertained to be due to the fact that the ore contained 50 per cent silica; 37 per cent zinc blende; and 7 per cent galena, and had, owing to the great difference of specific gravity of the above components, become streaked to the bottle; in other words, was not homogeneous.

The results on the Oregon pyrites and Calaveras pyrites will be seen in the following table:

OREGON ORE.				CALAVERAS ORE.			
Per Cent Extracted.				Per Cent Extracted.			
1% sol.	17.1	10.5	10.7	1% sol.	17.1	10.5	10.7
1% sol.	17.1	10.5	10.7	1% sol.	17.1	10.5	10.7
1% sol.	17.1	10.5	10.7	1% sol.	17.1	10.5	10.7
1% sol.	17.1	10.5	10.7	1% sol.	17.1	10.5	10.7

The above results show, first, that the process is certainly a failure on the Oregon ore, from which 90 per cent of the assay value has been extracted by chlorination; second, that 85 per cent of the assay value of gold and silver may be obtained from the Calaveras ore by a one per cent solution, using 1½ parts solution to 2½ parts ore. I shall discuss the economy of the process further on. I was now reasonably certain that while the process might be made to work on some ores, the statement that it is without a peer as regards all refractory ores, and that "the most refractory ores can be treated for from \$2.50 to \$3 per ton," was not apparent from any actual test that I had seen. I was now desirous of finding out, if possible, why the process would extract so well from one ore and be such a failure on another. I thought this might be due (1) to the proportions of free gold mixed with sulphurets, or (2) to the chemical composition of the ore and its consequent action on the solution, or (3) to the manner in which the gold is imprisoned within the sulphurets, i. e., whether each minute grain of the sulphurets contained the gold in such a mechanical form as would expose every particle of the gold successively to the action of the solution, or whether the gold was so finely divided and so completely enclosed by the sulphurets as not to be subjected to the solvent action of the solution.

To test the first, I tried amalgamation and found that the Oregon ore yielded absolutely nothing, while the Calaveras ore yielded only a trace, i. e., about 4 per cent, while the zinc ore yielded 33 per cent of Au by amalgamation. I could draw no satisfactory conclusions from these investigations. I next obtained quantitative analyses of these ores, which were as follows:

Oregon.	Zinc Ore.	Calaveras Ore.
SiO ₂ 23.10%	SiO ₂ 49.31%	Nearly pure
Fe 36.50%	CuS 18	FeS ₂ + SiO ₂
S 33.60%	FeS ₂ 6.43	
Arsenic 6.30%	PbS 6.39	
Sb 522	ZnS 31.69	

From these again I did not dare to draw any conclusion, except as to the zinc ore, which will be given below, without experimenting with a greater variety of ores of similar composition.

Then I took one-half A. T. of each of the three ores and roasted with N_2HCO_3 , obtaining the metallic oxides and Na_2SO_4 . I then leached out the Na_2SO_4 , and treated the residues repeatedly with strong nitric acid, passing off the sulphur, etc. Then finally I examined the residues with a strong microscope, such as is used in petrographical work.

(1) The Oregon ore showed no trace of gold in any form.

(2) The zinc ore showed the gold to have occurred or collected into one minute filiform nugget.

(3) The Calaveras ore showed also a nugget, but in addition several granules of gold about one-tenth the size of the nugget.

I believe from the above investigations (1) that the gold in the Oregon ore is so fine and so completely unenclosed as not to be accessible in the raw sulphurets to the solution. (2) That zinc having the greatest affinity of all the known metals for cyanogen, rendered the KCN inert, according to the following reaction:
 $4 KCN + ZnS = K_2S + Zn(CN)_2 \cdot 2 KCN$, or possibly the formation of some sulpho cyanide; the main point being the union of Zn with CN by direct combination or replacement, and thus causing the process to become partially inoperative in the case of the zinc ore. (3) That the gold was so combined mechanically in the Calaveras ore as to be almost completely accessible in the pyrites; and gold having a greater affinity for CN than iron, would displace iron in solution, if the CN were inefficient for both. When I introduced KHO into a waste solution, after removing the gold, I obtained a precipitate of ferrous hydrate, which, on exposure, oxidized to the brown ferric hydrate, showing beyond the possibility of a doubt that some iron had gone into solution.

Solubility of Gold.
Noticing that Dr. Johnston, the chemist of the State Mining Bureau, found that it took dental gold 48 hours to dissolve in a quiescent solution, and also that the amalgamation results on the zinc ore would indicate considerable free gold, I tried 26.46 mg. gold in the amount of solution that would be used on that amount of gold, if contained in five assay tons, i. e., about \$100 ore, on which the process is said to be most successful. That is, I took 5 x 18 cu. cm. or 90 cu. cm. of one per cent solution, and found that at the end of eight hours shaking it had entirely dissolved, thus showing that if

the gold was free and accessible in the zinc ore, as the microscopic examination would indicate, it would have dissolved had the KCN been active and no zinc present.

Economy of the Process (Without Regeneration).

The most favorable ore experimented on as assayed in gold 2.32 ounces to the ton, and in silver .72 ounces. Of this was extracted, with a one-half per cent solution, nearly equal weights of ore and solution, 84.5 per cent of the gold and 66.7 per cent of the silver. Counting gold at \$20 per ounce, and silver at \$1 per ounce, the assay value of the concentrates was \$47.11. In chlorinating according to the reduction works in California, a return of 90 per cent would be made at a charge of \$20 per ton. That is, \$22.40 would be returned. Now in the following estimate I do not claim strict economy, but only the closest approximation that I am able to make. The prices for KCN and zinc were given me by a well known dealer in San Francisco and were for large quantities. For one ton ore according to above, we would need 2000 pounds multiplied by one-half per cent, equaling 10 pounds pure KCN. Now cyanide of soda is said to contain 60 per cent KCN, therefore would require 16½ pounds cyanide (which is the cheapest of the three grades sold per percentage of purity) at a cost of 45 cents a pound. That is at a cost of \$7.50. The replacement of the gold by the zinc ore but very little sheet zinc, which may be obtained for 7½ cents per pound. It would seem that a superintendent and one laborer could tend to a plant capable of reducing 10 or 12 tons a day, and the power required is very slight. To make a liberal estimate, including the consumption of zinc, and without taking into account the regeneration of the solution, which point I did not hear of in time to look into, I should say that \$10 per ton would easily cover the running expenses of a plant to reduce the above sulphurets. The first cost of plant where the ore has already passed a 40 mesh is very slight, merely consisting of revolving herrels, or tubs with stirrers, filtering tanks and zinc filter, with a few storage tanks. The above estimate, if correct, means a return of \$37.11 per ton in place of \$22.40. I need hardly call attention to the obvious advantages possessed by the process as regards mechanical manipulation. By far the greatest, however, is the doing away with the expensive and disagreeable roasting furnace. The filtering in the case of sulphurets is ready and would seem to possess no difficulty. But as for the process being a panacea for all rebellious ores, I do not think the experiments of the owners themselves, some of which are as low as 65 per cent, show that, and I am certain that mine have not.

In the above I am aware that many of my deductions may have been hasty, and I would be pleased to hear from any one on any such point.

A Stockton Gas Well.

The Stockton Mail says: Work on John Jackson's gas well, located south of the City Homestead has ceased.

The well is now 1679 feet deep, and is regarded as finished. Should it be desirable at any time in the future to sink it further, however, it can be done, for the diameter at the bottom is eight inches.

The flow has not been accurately measured as yet for two reasons. The first is, no meter capable of measuring it can be obtained here; the second, the arrangement for confining the gas for measurement, is only a makeshift, and a large volume goes to waste. From what measurement could be obtained up to the present time, Mr. Jackson says the flow is from 75,000 to 100,000 cubic feet each 24 hours. He intends to place a gasometer over the well at once and utilize the flow.

"I propose," he said, to a representative of the Mail, "to lay a distributing system of pipes and sell the gas for fuel and illuminating purposes."

"Throughout the City Homestead?"
"I intend to supply not only the Homestead but the southern part of Stockton also. The Stockton Gas, Light and Heat Co. does not run its mains through that part of the town lying south of Mormon channel, so there is a good field open there for a separate system."

"But will you have enough gas to supply that field and the Homestead?"

"Well," was the answer, "if the flow isn't large enough there is plenty of room out on my piece for boring another well."

Mr. Jackson stated that the gas would be in use in the Homestead and the southern part of town within two or three months. He proposes to rush the work as fast as possible. He does not intend to secure guarantee of patronage to a certain amount before laying pipes, but will proceed with the work of laying mains without soliciting patronage in advance, being confident that consumers will apply for the gas of their own volition.

CHIEF Shift of the Worlds Fair Department of Mines and Mining, has assumed the duties of his office, and already has his hands full of work. N. P. Calvo of the United States of Columbia called at headquarters, and will secure space in the Mines and Mining Building for an exhibit from his country. The mineral exhibit from that country, he says, will be something unusual. Everything will be embraced, from the finest platinum to the coarsest iron.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

RICH ROCK.—*Ledger*, July 4: A. Mello brought to Jackson, on Wednesday, a sample of quartz taken from a claim owned by him and Alex Questa and M. Arata at Jackson Gate. The rock is sprinkled with free gold, and is as rich a specimen as has been taken out hereabout for a long time. Such quartz would yield considerably over \$100 per ton. It was taken from a depth of 50 feet. The ledge is reported to be eight feet wide, all of it of good-paying character. They have 150 tons of ore on the dump. The owners are all poor, and unable to bear the expense of putting up the necessary works to operate the mine. It is worthy of the investigation of capitalists seeking investments.

Calaveras.

THE FINNEGAN MINE.—*Mt. Echo*, July 3: John Finnegan formerly of this town, more recently of San Francisco, has commenced operations on the Finnegan mine at Carson Hill. This mine was discovered about the year 1856 by Mr. Finnegan himself and has been worked continuously since that time. Since the discovery of this mine there have been immense sums of gold taken out of it, and the mine is to-day one of the best in the country. Mr. Finnegan, the superintendent, tell us that he intends to commence sinking a shaft as early as possible.

RUMORED SALE.—*Mt. Echo*, July 2: It is reported that the Union Mine has been purchased by a syndicate in New York city and that all the copper mines that were worked here in the 60's will be opened up again, thereby giving employment to 150 more men.

El Dorado.

ACTIVE.—*Mt. Democrat*, July 4: The mining interests of El Dorado county seem to be growing quite active of late, and enterprises are being inaugurated in different parts of the county. Considerable feeling is being manifested in the Baltic district. At the Blue Gorge mine three tunnels have been run, crosscutting the vein, which seems to be 100 feet wide between walls. The entire vein is composed of material of low grade. There are several distinct ledges of quartz, varying in width, running lengthwise through this large body of gold-bearing material, the quartz being of better grade. The lowest tunnel now being run, cuts the vein at a depth of 100 feet and shows improvement in quality. A lower tunnel is in contemplation, which will cut the vein 700 feet below the surface. At this depth it is supposed, by experienced mining men, that the several quartz ledges crosscutted near the surface will be combined, forming a ledge of one, over 30 feet wide. This belief is justified by the developments already made.

THE BALTIC mine, in the same district, has a shaft down 120 feet, from which 110 tons of ore have been taken. Fifty tons of this ore was worked with an arrastra and yielded 80 ounces of retorted gold. During the run 16 pounds of quicksilver were lost, which evidently carried with it a large percentage of gold. The owners of the mine, Charles Varozza and L. Campini, are pleased with the result of the run, notwithstanding the heavy loss of gold, for want of experience in the manipulation of ore. The Scironi mine in the same district has 100 tons of ore on the dump, which according to tests made, will pay \$12 per ton. Other ledges in the district are being prospected. The Rosebud mine, in Brownsville mining district is a recent discovery made by Wm. Loupoule, and promises well, the ore showing considerable free gold. The Parker, in the same district, has a tunnel run through a body of good ore 200 feet long, three to five feet wide, Mr. Chas. Parker came down last Tuesday for additional machinery for their mill. At the Epley, belonging to the Pacific group, in Placerville mining district, a tunnel has been run in from Seallars ravine 200 feet, opening a vein eight feet wide, of good ore. The Gentle Annie, at Poverty Point, is running steadily and making its regular output of bullion. The Landecker gravel mine at Weaver Hill has a breast of rich gravel four feet thick and 200 feet wide. Capt. Newton commenced opening up the Darling mine, near Kelsey this week. The Martin & Ambro mine in the same district, has also commenced development work.

OUR SLATE quarries are crowded with orders for roofing slate beyond their capacity to fill. The wonder is that sufficient capital is not invested in this important business to open up the quarries and put in machinery with capacity to supply this growing demand.

GRAND VICTORY.—*El Dorado Republican*, July 2: A mining expert was in the county last week sampling some of the ore and tailings from the Grand Victory mine, the object being to ascertain whether a process could not be devised to save the gold contained in the ore and make the mine profitable. It is said that his experiments were satisfactory and may lead to the resumption of work on this mine.

BALTIC.—Charley Varozza and partner brought down from the Baltic mine last week 80 ounces of very pretty gold, taken from 50 tons of Baltic ore. They worked this ore with an arrastra and evidently lacked experience in working ore, as they lost 16 pounds of quicksilver during the run, and no telling how much gold, but certainly a heavy percentage.

Inyo.

A RICH STRIKE.—*Independent*, July 3: A letter received from Darwin yesterday states that a rich strike of ore has recently been made in the Promontory mine. In past years this mine has yielded thousands of dollars and there is a strong belief that the present strike will be as valuable as any discovery yet made. A short time ago Mr. Waterman sent two men there to do assessment work. They went down the old incline 20 feet and started to drive toward the foot-wall. After going in about four feet, they struck a fine body of lead ore 2½ feet thick. It assays 130 ounces silver and 50 per cent lead per ton. The new ledge dips about 10 degrees more vertical than the old incline. If this new strike realizes the expectations of its discoverers, it will make lively times in Darwin. The Promontory is owned by Messrs. Waterman, P. Reddy, J. S. Gorman and the Eddy estate.

HIRSH MINE.—*Index*, July 1: A visit to the

property shows it to be in good condition and paying well, although worked in a small way. About 35 tons of silver-lead ore has been shipped in the past three months, and has paid handsomely. The ledge now shows four feet in width of nearly solid quartz, the galena being found on the footwall. There are hundreds of thousands of tons of gold-bearing quartz in sight, which will pay to work with a mill at the drop of the Inyo canal and cheap methods of transporting low grade ore from the mine. The Hirsh has all the elements of a lasting dividend paying mine.

PANAMINT.—*Register*, July 2: S. P. McKnight has returned from Mesquite springs, out in Panamint country, and reports mining interests out there as looking indeed hopeful. At Modoc, Frank Fitzgerald keeps about 20 men steadily employed. At Panamint there are about 18 chloriders regularly working. The Surprise Valley mill recently made a run and highly satisfactory cleanup on ore furnished by the chloriders, some of the rock assaying way up in the hundreds of ounces of silver. A San Bernardino company is working claims upon some of which Mr. McKnight has been surveying. In one of these, the Anaconda, a seven-foot tunnel is now being run in solid 60-dollar ore. The body was struck after tunneling through 30 or 40 feet of barren quartz. It appears to be of considerable size, as no walls have been struck and the face of the tunnel is in ore. The entire country abounds in mineral and will become a lively section and good tributary to any railroad that will penetrate it. Like Owens valley, communication is the one thing needful.

Nevada.

RICH ORE FROM THE WISCONSIN.—*Grass Valley Tidings*, July 4: Eslick & Co. having abandoned the contract to sink the Wisconsin shaft, the owners of the property late last week put two men to work on day's pay. Two candle-boxes of rich ore were found underground, and Saturday, in sinking, a carload of ore almost rich enough to be termed "specimen" was extracted. The gold is coarse and lots of it is shown, while the rock abounds in other mineral and possesses generally that "lively" appearance so much esteemed by miners. The shaft on the Wisconsin is down 180 feet, and the ledge averages 14 inches in width. The claim is a part of what is known as the Menlo property and is undoubtedly a first-class possession.

RIVER MINING.—*Grass Valley Union*, July 8: Thos. C. Bourn was up from Pleasant valley yesterday obtaining supplies for the camp that his company is establishing on the Yuba below Bridgeport, to work the bed of the river this season. The river is now low, as but little snow is left in the mountains to keep it up, and in a week or two it will be down to the lowest summer stage. The work of putting in a wing dam, to turn the course of the river will be commenced in a few days. Besides this company, which consists of white men, several Chinese companies will work the river bed in the same vicinity.

Plumas.

A NEW MILL.—*Greenville Bulletin*, July 2: From Mr. Garland we learn that Messrs. Sutton, Orr, Braden and Larison are opening up, a quartz mine back of Snake lake, once known as the Jackson ledge and worked by the arrastra process. They are now building a road so that the ore can be hauled to a five-stamp mill which they are erecting above Maxwell's, in Butterly valley. The ore is said to prospect very well and the owners are confident of securing good pay. Alex. Cameron, superintendent of the Feather River G. M. Co., was in town Monday, and from him we learn that an important development has been made in the lower tunnel of that mine. They now have a good strong vein of quartz which prospects exceedingly well. He says that 20 stamps of the mill will be started as soon as water can be brought in for that purpose. The water will probably be brought in from Ohio creek. The work of sinking the shaft at the Crescent mine continues with that system and steadiness for which Superintendent Whitney is noted. Reasonably good progress is being made. Joseph Gruss is operating the Genessee mine, the usual force of men being employed in extracting ore and operating the mill. The owners of the Glazier mine on the North Fork have been extending their lower tunnel and have broken into a good bed of gravel from which good pay is reported. A small force of men is working at the Indian Valley and it is rumored that some important developments have been made. John Taylor and others are preparing to start the Arcadian mill on ore from a mine in Round valley owned by H. Gansir and others.

GREEN MT.—*National*, July 4: The Green Mountain mine, situated above the Crescent mine in Indian valley, has changed hands. Mr. G. P. Cornell and Col. W. T. Smith, of S. F., becoming the owners. Work in the way of clearing out tunnels, and making general repairs commenced the first of the week, and when once got into good working shape, there will be lively times again at this old camp.

San Diego.

JULIAN AND BANNER.—*Julian Sentinel*, July 2: The Chloriders of the Warlock mine have had another crushing of ore put under the Helvetia stamps, which panned out \$34 per ton. The Chaparral boys are awaiting the pleasure or leisure of the Helvetia mill to crush a fine lot of ore. Mr. Havermale is keeping the stamps pretty busy on ore from the High Peak and it is only between times that the boys can get in their work. Preparations are being made to start up the Owens mine by H. A. Williams. Word has been received that the Gold King and Queen Co. will soon resume operations on these properties on a more extensive scale than heretofore. The force at Stonewall has been increased and the steady output of the mine is growing every month. Dr. Valle of San Diego is interested in the Three Brothers mine, and is here for the purpose of commencing work.

Shasta.

ANOTHER MINING SALE.—*Shasta Democrat*, July 1: Another important sale of mining property was closed last Thursday afternoon. The Mammoth mine, with both extensions east and west situated in Old Diggins district and adjoining the Central, owned by Frank Young, Lawrence Garrecht and Frank Panter, was sold to P. J. Torney, a commission merchant of San Francisco, for \$45,000. The first payment of \$5,000 was paid Thursday and the other payments will be made in two installments at stated periods. Mr. Torney is one of a company of San Francisco and Eastern capitalists. Mr. Morton, formerly superintendent of the Walker

mine, who negotiated the sale, took possession of the mine Friday as superintendent for the new company, and will proceed to develop the mine on a large scale with the intention of putting up a large mill in the near future. This sale adds one more strong mining company to the mining enterprises of Shasta county, and we congratulate the former owners of the property for making the sale.

IRON INTERESTS.—*Redding Free Press*, July 4: It has always seemed strange to us that the fine body of iron ore, known to exist at Iron mountain on the McCloud river, has not been utilized. Some nine years ago action was taken by an organized company to open up the deposit, and, in fact, much land and water rights were secured. From Robert Radcliff, who was in Redding Wednesday, we learn that he is the appointed agent of the company in this county, and that through him the assessment work has been done from time to time. Now he has an order for two carloads of the ore to be shipped from Smithson, 11 miles distant, to which point the ore will have to be hauled in wagons. Mr. Radcliff showed us letters and telegrams instructing him to ship two carloads at once, and he was here this week to secure teams for that purpose. The ore will be shipped to the Pacific Rolling Mills, San Francisco, and if satisfactory, several thousand tons will be ordered. The mine is located one mile from the United States Fishery. About two carloads of ore have already been mined. It is only necessary to blast out and quarry the rock. Lying on the steep mountain side, the mine can be worked to the best advantage.

Sierra.

NORTH AMERICA.—*Mt. Messenger*, July 4: We learn that the North America mine, at Hepsidam, has been put in good order for working. Under the supervision of the Executor of the last will of Miles Schofield, deceased, the tunnel has been re-improved wherever it was needed, and other improvements effected, which would seem to indicate that active operations are to be renewed.

TO BE DEVELOPED.—*Mt. Messenger*, June 27: A company of San Francisco capitalists has taken hold of the Ante Up Quartz Claim, located near the Mountain House, and the work of development has begun. A boarding house is being put up at the mouth of the old tunnel, in Woodruffe Creek, that will accommodate 15 or 20 men, the first mentioned number being all that will be likely to be needed for some time. The lumber used is bound together with wire and lowered away down the steep hillside to where it is needed. A tunnel was run on the property some years since, a distance of some 1200 or 1500 feet. This tunnel will be repaired and extended. The ledge to be developed is the Brush Creek ledge, which was remarkably rich as far as worked. When the tunnel is again open to the ledge, drifts will be pushed both ways along it. R. H. Judson is in charge of the work which will be pushed as rapidly as possible.

Siskiyou

WILLOW CREEK.—*Telegram*, July 3: Sydney Richardson of Willow Creek invited the *Telegram* representative to take a trip to that part of the country and see the many new mines that are now being opened there. A company from Sacramento has lately started operations there on an extensive scale. A Portland Co. also made locations there and will push operations immediately. The coal mines also being developed more extensively than ever, and continues to show indications of a permanent deposit of superior coal. The Willow Creek section is rapidly coming to the front as a mining locality. The Yreka Blue Gravel Co. continue to find blue gravel, which goes to prove that the deposit is a permanent one, instead of a thin layer as many supposed. They are working day and night and will soon know exactly what they have. At any rate everything at present is as favorable as could be desired. Such of the mines on Humburg as are enabled to work at all, are giving flattering returns to their owners, showing that Humburg still holds her high position as a mining locality. On the Klamath nearly all the miners are working away with more or less degrees of success, and many of them are doing quite well. At Scott Bar and Hamburg Bar nearly all the principal mines are shut down through failure of the water supply. The mines of Steele & Co. and Bennett's are doing very well. George Blessing has recently found some very good prospects on Humburg gulch, about a mile and a half west of Yreka. Considerable prospecting work is being done by miners on the hills west of Yreka.

RIVER MINING.—*Yreka Journal*, July 27: M. K. Thomas, Superintendent of the Beebe Bar mine, Klamath river, is fixing up the claim in fine style for successful work. He has dammed the river about 80 feet of its width, running a wing dam down stream over 200 feet, besides making a race in which he has the dip wheel, derrick wheel and pump wheel located. The derrick boom will have a swing for dunnage of pay gravel with the greatest ease into the sluices, and for dropping great boulders and other refuse beyond the race into the main body of the river. This claim is owned by J. S. Cleland of this city, who intends operating it on an extensive scale, with a firm belief that it will pay handsomely, as it undoubtedly will. The late rain showers dissolved the snow so rapidly on the Salmon range, that the supply of water in the ditches to Quartz valley and Oro Fino, is very light, which will make the season rather short for mining. The frequent rains this spring and summer up to this time have proven very effective however, otherwise the season would have been much shorter, on account of the extraordinary light winter. The work of sinking the shaft in the Yreka Blue Gravel Co.'s mine, just south of town, is progressing gradually, with day and night shifts, and in a few days more, an extra hand will be added to each shift to reach the bedrock more rapidly. The blue gravel becomes coarser with better indications of gold, the deeper it is prospected. The compartment shaft will enable the men to have good air circulation all the way down, no matter how deep, as a current of fresh air can be worked down whenever needed, or in case of any foul gases or damps being reached. Frazer & Co., of Indian Creek, are now taking out considerable quartz to keep their mill running constantly, the quartz averaging about \$5 a ton.

KNOW NOTHING CREEK MINES.—*Trinity Journal*, July 4: D. Hanson returned Sunday from Know-Nothing creek where, with other Trinity people, he is interested in several good quartz mines. We are indebted to him for the following items:

The Hansen mine, owned by D. Hansen and August Dannenbrink looks well and development work is now being done on the property. The ledge is about four feet wide and prospects good. At the Know-Nothing mine everything was activity. Fourteen men are employed and the four-stamp mill is kept grinding away on quartz night and day. The cleanups have been very satisfactory, and the company will now have the pleasure of enjoying a dividend regularly hereafter. The expense of getting this valuable piece of property in shape and on a paying basis has been great. The ledge carries from three to seven feet of quartz and looks permanent. It is more than probable that four more stamps will be added to the mill before winter. The mine is owned by Riley, Bennett & Hanson. The Gold Run mine, the property of the Dannenbrink Bros., R. Jankans and D. Hanson, is looking fine. The ledge is from six inches to four feet in width and the rock prospects well. From 10 to 14 men are employed. They have been running a tunnel on the property. Mr. Hansen says he never saw the mines looking so well, and is very sanguine that in the near future that camp will boast of several dividend-paying properties.

NEVADA

Washoe District.

ANDES.—*Virginia Enterprise*, July 4: North drift from east crosscut No. 2 on the 420 level has been advanced 20 feet; face in quartz yielding low assays. East crosscut from the north drift on the 420 level advanced 17 feet. Face in quartz yielding low assays.

UTAH.—The south drift from the bottom of the winze station has been extended 44 feet; total, 56 feet. This drift having passed into quartz, we are following it laterally instead of crosscutting west, as contemplated a week ago.

SEG. BELCHER.—West crosscut from south lateral drift on 600 level has been advanced 22 feet, and is now out 177 feet; face in soft ground composed of porphyry, clay and low-grade quartz.

JUSTICE.—There has been no work done in the 820 level north drift since last report. Shipped 164 tons of ore the past week, worth \$17.02 a ton as per battery samples.

KENTUCK.—Have stopped the east crosscut from the south lateral drift from the east raise, 1000 level, in the hanging wall. Started a north drift from the raise opposite the south drift and are out a distance of 17 feet; face in quartz of low grade. The west crosscut from the top of the north raise has been advanced eight feet; face in quartz showing spots of ore. Have continued the raise from the 950 level eight feet, and are up 29 feet; the top is in low-grade quartz.

BELCHER.—The raise from the south lateral drift from No. 2 crosscut, 200 level, has been advanced 40 feet and is now up 96 feet; the top is in a mixture of porphyry and low-grade quartz. The south drift from the main west crosscut from the shaft, 300 level, has been extended 26 feet and is out 330 feet; face in porphyry with streaks of low-grade quartz through it. Have stopped the 1500 level east crosscut in the hanging wall, and have started in an east crosscut from the north lateral drift on the 1300 level, which is out 24 feet in low-grade quartz.

CROWN POINT.—The south lateral drift from the 300 level south winze has been advanced five feet; the greater portion of the time has been occupied in timbering; the face is nearly all in clay. Have resumed work in the face of the 500 level west crosscut, which is out 195 feet; the face is in porphyry, clay and small streaks of quartz. The east crosscut from the south lateral drift on the 1000 level has been advanced 18 feet, total, 205 feet; face in porphyry and clay.

SCORPION.—The joint north drift from the 900 level of the Union shaft was advanced 21 feet; total, 165 feet from shaft station. Formation passed through is porphyry and slips of clay; face of drift shows seepage of water.

SAVAGE.—Milled five tons of ore worth \$18.50 a ton, as per battery samples. Bullion on hand, \$27,331. On the 1100 level the north drift from the Hale & Norcross side was advanced 12 feet; total, 178. The grade of the quartz in this drift has improved the past week—the last eight feet of the drift is all in fair-grade ore which is being saved for pay.

HALE & NORCROSS.—On the 1500 level the south lateral drift was advanced 25 feet; total, 140 feet from station; face in porphyry and seams of quartz. The north lateral drift on this level was advanced 15 feet; total, 170 feet from station. No. 1 west crosscut started at a point 75 feet north from the incline was advanced 27 feet; total, 40 feet. This drift exposes a strong body of low-grade quartz; 75 feet north of this crosscut we have started No. 2 west crosscut, and advanced same to feet, all in quartz, carrying some streaks of ore. We have completed chutes for waste and pay rock below the 1500 station, and have resumed work below this point in the main incline.

UNION SHAFT.—The west drift from the shaft, 900 level, has been advanced during the week 55 feet, making a total distance of 530 feet; face is in clay and porphyry.

SIERRA NEVADA.—630 level west crosscut No. 1 from northwest drift 571 feet from the shaft, is advanced 35 feet; total, 571 feet. The Kenosha tunnel was enlarged and repaired 52 feet during the week. Total, 312 feet.

NEW YORK.—The 600 level north drift is out 275 feet north of shaft; face in porphyry. North drift, 1100 level, is in 568 feet north of shaft. Formation, quartz yielding low assays.

SILVER HILL.—Southwest drift, 50 level, is out from the shaft 164 feet; face is in clay and porphyry. South crosscut, 160 level, is out from the winze 614 feet; face in hard porphyry.

WARD SHAFT.—The south drift from the 1800 level station is out 130 feet; face in porphyry.

CHOLLAR.—The south drift, 1400 level, is out 183 feet from the north line; face in porphyry. The joint winze in east crosscut, 1400 level, is down 98 feet. The bottom is in porphyry and quartz.

BULLION.—The south drift, 1300 level, advanced 33 feet during the week; total length from north line, 193 feet; face in porphyry.

EXCHEQUER.—East crosscut on north line, 600 level, is out 246 feet; face in porphyry and clay.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 600 level, is out 21 feet; face in quartz.

POTOSI.—The south drift from Chollar incline, 1100 level, connected with the north drift from the

wine during the week. The wine is down 189 feet below the 1400 level. The bottom is in porphyry and quartz.

Hawthorne District.

LAPANTA.—Walker Lake Bulletin, July 1: Still raising and stopping above the east drift of No. 6 incline, vein showing about the same; producing as usual; incline still being extended; vein about the same; stopping above the tunnel, and extended the northwest drift, both of which show very well.

PAMILCO.—Main tunnel being driven ahead, now 35 the past the chute, ground snifter. Lessees still extracting ore from the stapes at the north end of the mine.

CENTRAL.—Have resumed sinking the incline below the 150-foot point; the vein of ore veing about two feet wide, carrying 25 per cent lead, 50 ounces silver, \$35 gold. Stopes above 75-foot level producing as usual. Hoisting ore for shipment at present.

MOUNTAIN KING.—Main tunnel still being extended, face 72 feet beyond the first ledge; formation talc and quartz.

HARTFORD.—Sinking on vein still continues; producing lead, silver and gold ore as usual.

BEACON.—Still stopping from incline; producing the usual amount of ore.

GOLD BAR.—South drift, Martinez tunnel, been extended 12 feet during the week; ledge strong, producing considerable rich ore.

CONFIDENCE.—New incline down 48 feet; ledge about 2 1/2 feet wide, carrying considerable quartz, some silver and considerable copper stain coming in, indicating proximity to ore.

FAIRMOUNT.—During the week the main south drift has been extended eight feet vein showing about the same. Incline below the drift shows vein from six to eight inches wide; ore running from 300 to 400 ounces. Shipment made this week to Mt. Diablo mill.

CHALLENGE.—Main tunnel being extended. Shipped six tons to Mt. Diablo mill this week. First class 177 ounces.

NEW YORK.—Still extending the drift.

CAPITAL.—Main drift being extended on the vein; showing large formation streaks of ore through it.

JENNY LIND (Marietta).—Shipped a carload of sulphuretted silver ore to the Mt. Diablo mill this week.

RIP VAN WINKLE (Marietta).—Main tunnel being driven on the vein to the east, is now in 170 feet, following the vein. It shows ore all the way, as the vein is followed east, the grade in silver is found to increase. Lead about the same—65 per cent.

Tuscarora District.

DEL MONTE.—Times Review, July 3: Third level: Joint west crosscut extended 10 feet, will reach the vein this week.

NAVAJO.—South intermediate drift has been extended 12 feet, the vein is not showing quite as well. The 350 stopes look about as usual.

COMMONWEALTH.—Fourth level: North drift from east crosscut extended 11 feet. No. 2 raise from north drift up 10 feet in the vein. No. 1 winze has been started to prospect the ore exposed in north drift.

NEVADA QUEEN.—South drift from east crosscut, fourth level of Commonwealth, extended 10 feet. West crosscut advanced 10 feet. East crosscut 10 feet to hanging wall, exposing 18 inches of low grade ore laying next to the wall.

BELLE ISLE.—North drift from the west crosscut, 350-foot level, has encountered a break, the ore up to this point is very fine. Have resumed work in the line crosscut, same level, progress 25 feet. Have started cutting out for a winze on the west vein. The stopes above the 350-foot level are looking well and have yielded 19 cars of first-class and 43 cars of second-class ore.

NORTH COMMONWEALTH.—First level: Produced 9 cars ore, average car sample assay \$359 per ton.

NORTH BELLE ISLE.—East crosscut, 450-foot level Belle Isle, extended 20 feet, rock breaking well and looks favorable for ore. No. 2 crosscut, 400-foot level, extended 13 feet, rock quartz and gives low assays. West crosscut, 600-foot level, extended 14 feet, rock very hard. East crosscut, same place, extended 21 feet, face getting harder and shows seams of spar. The stopes on the 400-foot level are extending gradually farther south.

Jackrabbit District.

JUNCTION TUNNEL.—Pioche Record, July 2: The ore body encountered in the Junction tunnel at the Day mine, of which mention was made last week, has materially improved during the past few days. The latest reports state it to be five feet wide, of a soft character, easily mined and assaying upwards of 100 ounces in silver per ton. This adds another magnificent ore body to the number already uncovered there by the work of the present company and makes more certain the fact the Day mine is one of the greatest and best in this vicinity.

Bristol District.

COPPER FURNACE.—Pioche Record, July 2: From Wm. J. Roe, who was in from Bristol to-day, we learn that the small copper furnace which he and his brother Charles L. have been at work on for a month past, is about completed and that work will begin about the last of this month. The furnace is located at the old Kattenhorn well, below the mill of the Bristol Co., and is of five tons capacity per day. The ore to be worked lies on the dump of the Cave mine in Bristol district, five miles from the furnace. The first run will produce about 15 tons of copper of high grade as was determined at the successful runs on the same quality of ore which the Roe Brothers made at the same place two years ago.

Montgomery District.

FROM BREFYFOGLE.—Walker Lake Bulletin, July 1: M. T. Plamanez, who has just returned from the Breyfogle company, furnishes the following items: Angus MacArthur, late of Candelaria, is foreman for Montgomery. About 35 men are now employed by Montgomery, 24 in the mine and the others at the prospecting mill and in building roads. Wages are \$4 per day, board \$10 per week. A blacksmith shop, tool house and other buildings are under way. The material for a hotel building has been ordered. In clearing for the foundation of the blacksmith shop a boulder was encountered which yielded \$3000. One of the five partners interested with Montgomery has sold out his interest for \$15,000 and returned to San Francisco. Water is to be brought into the camp at once. A pipe line will be laid from a spring five miles distant. It is a settled

fact that a 20-stamp quartz mill will be put in Montgomery this fall. As work progresses and depth is attained in the ledge the ore body is widening out. add New Mexico

BIG OPERATION.—Silver City Enterprise, July 3: One of the most gigantic and best managed mining operations in the southwest is the working of the Confidence and Blackbird mines on Silver Creek in the Mogollon mountains. The main adit level is now in 980 feet, showing a continuous vein of an average width of eight feet. For by far the greater part of the level the vein is in good grade of milling ore and for the last 400 feet, the ore body has been continuous and averages about seven feet in width. Three shafts have been sunk from the apex of the vein on the hill above to intersect this main level, two of the shafts have already made connections and the third will be sunk to reach the level when 120 feet more is driven. The third shaft is now down over 200 feet and is being steadily worked to reach the point of intersection at same time as reached by the level. The management shows good judgement in their mode of procedure. Estimating on a conservative basis over 100,000 tons of pay ore is now blocked out and in sight above the main level, while a winze of 90 feet in depth below shows the vein stronger and of higher grade than above. The intention is to carry the adit in a farther distance of 400 feet, when arrangement will be made for the construction of a mill of sufficient capacity to handle the enormous ore bodies exposed in the mine. The water power of Whitewater canyon, some 12,000 feet distant will be utilized, the mill will be placed immediately at the mine and the force transmitted from the water power by dynamos and cable to the mine. This will be a novelty for the mining people of the west, and there is probably no other such plant in use in America, although one of similar construction has been in use in Australia for years past. [There are several such plants in California. Eds. Press.] With the vast bodies of rich ore developed in the mine and the efficient and economical method of reduction contemplated, there is little doubt that the Confidence will be such a success as to engender a feeling of emulation in other mining companies and lead to great and permanent good to the mining industry of the whole State.

ARIZONA.

BLACK HORSE.—Journal Miner, July 4: A large body of very high-grade ore was struck in the Black Horse mine on Sunday. This property has yielded good shipping ore whenever worked, and promises to continue its reputation under the present management of Mr. Hall. The United States M. Co., recently organized by English capitalists to operate in this county, has a force of 12 men prospecting different claims in the mountains west of Walnut Grove. We hear their prospects are looking excellent.

THE YUMA.—The Yuma Copper Co. feels very much elated over the news received in St. Louis from the property. The letter was written on June 7th, after a full day's run had been made with the smelter. The amount of bullion turned out was four tons. After the men get used to their work and the machinery is running smoothly it is expected that six tons of bullion will be the average daily output. Water continues to run 40,000 gallons a day, and the company is at present using 10 gallons. A shipment, the first in the history of the mine, of the first day's run was made on the 10th ult. A party of prospectors from the southern part of the territory, attracted by the Journal Miner's recent article in reference to the new mineral discovery near the Grand canyon, north of Prescott Junction, arrived at the latter place on Sunday evening. They were shown specimens of ore from the new discovery by Z. T. Phillips, one of the locators, and were well pleased with the appearance and left yesterday for National canyon. Several prospectors have gone into this new district recently. Messrs. Phillips and Healey, the original discoverers and locators of the mineral, have sent a small force of men to the canyon to develop their properties.

DAKOTA.

GALENA.—Deadwood Pioneer, July 2: Sam Moll, superintendent of the Hayes mine, is said to have torn down 50 tons of rock and ore—more or less rock—at a single blast, on Sunday.

FLOAT.—Coal is reported to have been found six miles north of Rapid on the ranch of Peter Finney, at a depth of 18 feet. Work will be resumed at the Keystone chlorination works to-day. The strike which was reported at those works is also satisfactorily settled. S. Matherson, one of the stockholders in the Richmond mine at Galena, arrived yesterday and left for the property. The works will no doubt resume operations.

IDAHO.

THE COW CREEK MINES.—DeLamar Nugget, July 2: This district, beginning about two miles west of DeLamar and extending northwest about four miles, has been much talked of since reports of big discoveries were made last fall. As soon as the snow was gone in the spring the country was filled with prospectors and a great many claims have been located. Some years ago a number of claims were located and considerable work done on Cow Creek, but the country then prospecting is some three miles east of the new section which is now attracting attention. Among the most promising of the claims in the new section, is one owned W. A. Seaton. This claim has been developed by an open cut, in which the ledge has been crosscut at a depth of 15 feet. The walls at this depth are apparently defined and the pitch of the ledge shown to be about 30 degrees from perpendicular. A seam of very hard quartz, a foot thick, next to the foot-wall shows high-grade silver ore. The balance of the ledge is of a softer decomposed quartz which is all good milling. Averages of a number of samples taken across the entire ledge show the ore to run upward of \$100 per ton. Extensions of this claim have been located both north and south, on croppings which can be traced on the surface, and some work has been done on them, but not sufficient to define the ledge. Three or four claims have been located east of this which are said to make excellent showings. Two miles or more southwest of this group Mr. Thomason and other parties have located claims which are said to promise well. About one

mile northwest of the Seaton mine is the much talked of Wellinger claim. From the appearances of all the claims from south of Seaton's to Farmer's, it is almost safe to predict that prospectors have made discoveries here which will eventually make a very rich mining camp. The quartz is certainly very high grade and the lode will probably show up a great width. This is the opinion of the Nugget expert, made upon his first visit to the district. He certainly can assert that there is enough now in sight to justify the investment of more capital in development work. The locations mentioned were all that were visited by our expert, but they do not include nearly all that properly belong to that district. The Homestake mine, and others lying between DeLamar and the claims visited, although not on the Cow creek side, are generally classed as a part of the district. They are all on a belt, or line, connecting with the DeLamar mines, and form conclusively the continuation of a great mineral zone from DeLamar northeast for at least five miles. If the end of the belt reaching in this direction should develop as good as it now promises, it will certainly establish DeLamar as the center of the greatest mining district in Idaho, if no more.

LOWER CALIFORNIA.

COPPER.—Lower California, July 2: One of the coming bonanzas of Lower California is the Francesa copper mine in Trinidad valley, 115 miles southeast of Ensenada. It is said to be one of the biggest deposits of copper in the country, thousands of tons of ore being in sight, and numerous assays already made prove the ore to be 68 per cent pure and showing the existence of both gold and silver. Mr. Tyack, an experienced mining engineer, once reported the Francesa as the most promising mine in this country. It is now controlled by H. A. Howard, Dr. O'Clery and others. When the railroad is built into Trinidad valley the Francesa will be heard from.

CEDROS ISLAND.—The Cedros Island M. and M. Co. has made a proposition to the Pacific Coast Steamship Co., owners of the steamer Newbern, to have that vessel stop at Cedros island on her trips to and from Mazatlan, guaranteeing that the steamer will be furnished a cargo of 500 tons of ore at the island on every up trip, the ore to be delivered in San Diego. On every south-bound trip the Newbern is to take supplies to the island. The owners of the Eureka gold mine in Guadalupe valley have sent a quantity of ore to San Francisco to be assayed. Ore from this mine has been assayed in San Diego, yielding a return of \$80 a ton, but for their own satisfaction the owners desire to have several tests made.

MONTANA.

A BIG PARROT DIVIDEND.—Butte Inter Mountain, July 1: The annual meeting of the Parrot Silver & Copper Mining Co., was held in this city to-day, and officers were elected for the ensuing year as follows: Pres., Franklin Farrell; V. P., S. T. Hauser; Sec. and Treas., J. E. Gaylord; Directors, Franklin Farrell, A. F. Mageon, Mr. Thurrell, S. T. Hauser, J. E. Gaylord, A. M. Holter, C. E. Tomlinson. The directors received the report of the officers, which was very encouraging. A visit was paid to the smelting plant and everything was found in first-class shape. No new improvements will be made to the property this year besides those in course of construction. At the smelting plant two new converters are being placed in position. The directors did not complete all of their business this morning and are in session this afternoon. The mine which has been closed down pending the erection of the new hoisting plant was started up to-day, in order to keep the smelter and concentrator in operation, which were running out of ore. The old hoist was used, however, the new not being ready yet. The most encouraging feature of the meeting was the declaration of an extra dividend of 10 per cent on the capital stock, aggregating \$180,000. This shows a splendid condition of affairs, and that the company is in a position to make such a liberal distribution among the stockholders, notwithstanding the new hoisting plant, regarded as the finest in the State, speaks volumes for the excellent management of General Manager Gaylord and Superintendent Ben Tibbey. The regular monthly dividend is \$8,000, or one per cent on the capital stock. Up to May the company was credited with \$840,000 dividends, and this extra dividend of \$180,000 brings the total up to \$1,020,000.

ENJOINED BY THE ANACONDA.—It is understood to-day that the Anaconda Co. has obtained an order from the court restraining and enjoining the owners of the Clark mine from taking out any ore. It appears that the Clark mine, which is owned by H. L. Frank and others, is situated south of the Green Mountain and Mountain Consolidated mines. A few days ago a rich body of ore was encountered in the Clark, and about thirty tons of the new strike was brought to the surface where the enjoining proceedings were instituted. Besides stopping the company from working their claim, the Anaconda Co. wants \$1,200 for the ore taken out.

NEW MEXICO.

IMPORTANT GOLD DISCOVERY.—New Mexican, July 3: Information of a wonderfully rich and extensive free gold discovery in the mountain district between San Pedro and Bernalillo reached the city yesterday. It appears that some three days ago a couple of prospectors who have long been at work on a quartz lead in that locality, and which is supposed to form the southeast extension of the San Lazarus gold belt, were knocking about over the hills when they came upon a deposit of decomposed yellow stuff, and, largely out of idle curiosity, gathered up a sack full of the same and began panning it. To their great joy as many as 100 distinct colors were found in the bottom of the first pan, and continuing their pleasant task, they found that each succeeding pan showed up still better. They were only about 12 miles northeast of Bernalillo station and there they went on the following day and carried several sacks of the ore, which was panned out there in the presence of an excited crowd of spectators, among others, Mr. Thomas, the A. T. & S. F. station agent, and Hon. M. S. Otero. The miners had in the mean time already staked off some 20 odd claims for themselves, and it was not long before the news spread and others were on the

ground. A great deal of excitement prevailed and is still on. That which makes the find more valuable is the fact that a splendid stream of water runs right through it, the stream being known as the Ojo de la Casa (spring of the house) from which it takes its source. There is a vast area of the mineral and it yields from 5 to 25 cents in fine gold to the pan. Already over 100 claims have been located. These facts are gathered from Hon. Amado Chavez, who arrived from Bernalillo yesterday. He examined samples of the ore and saw the gold panned out of it. Several parties left Santa Fe last night to investigate the matter for themselves.

OREGON.

MCARTHUR-FORREST PROCESS.—Oregonian, June 27: It is learned that the McArthur-Forrest process, of Denver, expect to make a second test on 100 tons of ore at the Eureka and Excelsior mines in Baker county, about the first of July. The well-known mining expert, John B. Farish, of Denver, will superintend the test on behalf of the company. Work on these well-known paying properties has been suspended for some time owing to some hitch in the plant. The new plant, put in at a cost of \$100,000, was defective and the McArthur-Forrest people have undertaken to remedy these defects with improvements of their own. They have already expended about \$8000, and now are about ready to make another test. This money is to be refunded to them by the company, if the new process proves a success. It is claimed for the McArthur-Forrest process that it can treat the ore at a maximum cost of \$6.50 a ton by leaching it with cyanide of potassium. This process is said to have proved a success with base sulphur ores in Australia and Africa, and it is believed that it will prove equally as successful here. If the test at the Eureka and Excelsior mines proves a success the company will adopt the process and erect a plant with a capacity of 100 tons per diem. These mines are in the Cracker creek district and they are the richest in Eastern Oregon. The owners are St. Louis capitalists, and Jonathan Bourne of this city.

UTAH.

NEW FIND.—Park Record, July 4: New finds of ore are becoming of weekly occurrence in this camp, there having been two since our last issue. The find of Rosscamp and Glenn, in Thayne's canyon, was the first and now comes news of a strike in the Pearl J. C., owned by Pat Lynch, Mrs. Hall, L. H. Farnsworth and others, and under verbal lease to W. H. Crockett. The ground lays just across the canyon from the Glencoe and considerable work has been done on it in the past. This spring Crockett obtained a verbal lease on the property and put a force of men at work driving a tunnel into the hill much lower down than any of the old workings. After running a distance of 50 feet he cut the vein, which carries a small streak of rich ore and gives every indication of leading to a large body of good shipping rock. The formation is porphyry and granite, very open, and possessing all the qualities necessary for making rich ore. The vein has the same course as all other veins in the camp, and dips to the northwest at about 40 degrees. At this writing very little prospecting has been done on the vein and it is impossible to speak definitely of its extent and permanency. This strike is another card for Blue Ledge district, which is rapidly coming to the front since the rich developments in the Glencoe.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

CAIN FRUIT AND NURSERY CO., July 1. Capital Stock, \$72,000. Directors—P. P. Cain, A. P. Jacobs, J. B. Agnew, C. H. Patchett and Geo. F. Beales.

PACIFIC FIELD SPORTS PUBLISHING CO., July 1. Capital Stock, \$45,000. Directors—John T. Corey, J. L. Corey, J. M. Carroll, J. P. and G. W. Reynolds.

GARDEN GRAVEL M. CO., July 1. Location, Calaveras Co. Capital Stock, \$1,000,000. Directors—F. I. Kendall, J. T. Carey, J. N. Thorne, N. S. Brown and Juan M. Luce.

BLUE LAKE LAND AND WATER CO., July 2. Capital Stock, \$1,000,000. Directors—E. J. Baldwin, R. H. Lloyd, Geo. W. Baldwin, W. S. Wood, and H. A. Unruh.

NORTH COMSTOCK DEVELOPMENT CO., July 6. Capital Stock, \$1,000,000. Directors—Monroe Thompson, S. E. Ward, L. B. Clark, W. L. Brown and Thos. Cole.

HAWAIIAN CONSTRUCTION CO., July 6. Capital Stock, \$100,000. Directors—A. Nelson, A. Rowe, J. Tuft, J. McKenna, and C. Thompson.

MERCHANTS MERCANTILE COLLECTION CO., July 6. Capital Stock, \$25,000. Directors—G. H. Umbsen, H. P. Umbsen, Z. U. Dodge, G. M. Perine and F. P. Latson.

C. A. WETMORE CO., July 3. Object, to carry on a general commercial, manufacturing, warehouse, commission, brokerage, factor and agency business, and incidentally to carry on and improve the fruit, raisin, olive, oil, orchard and vineyard industries. Capital stock, \$250,000. Directors—Charles A. Wetmore, Charles N. Felton, Charles K. Kirby, Maurice Clark and Clarence J. Wetmore.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

GEO. WILSON—Sacramento Co.
J. C. HOAG—San Francisco.
G. B. GILG—San Luis Obispo Co.
SAMUEL E. WATSON—Sonoma Co.
HEERAN STANLEY—Modoc Co.
C. J. WADDE—San Bernardino Co.
W. W. MILLER—Butte Co.
R. G. BAILEY—San Francisco.
E. H. SCHAEFFLE—Central California.
WM. M. HILGARY—Oregon.
ARTHUR M. MITCHELL—Oregon.
N. M. NEWPORT—Oregon.

MECHANICAL PROGRESS

Recalescence in Steel and Iron.

Mr. F. J. Smith in the *Philosophical Magazine* gives an account of some new methods of investigating the points of recalescence in steel and iron. The object of the experiments was to discover the time connection which exists between the change of form (expansion and contraction) and the change of temperature. Several methods of experimentations were tried, and the following was the one finally adopted. The upper end of the steel wire to be tested was fixed vertically; the lower end was attached to a long light lever of aluminum, so arranged that a small change of length of the wire caused a large movement of the end of the lever, which traced a line on the smoked surface of paper rotating on an ordinary physiological chronograph cylinder. A platinum-rhodium thermocouple, twisted round the wire where it was heated, was in circuit with a galvanometer. By means of this combination the temperatures at which the changes of length of the wire took place were read. The movements of the beam of light reflected from the galvanometer were recorded on a moving photographic film.

The outcome of the experiments was that the changes of form of the metal under examination took place at the times of change of temperature, so that a curve so traced on the smoked paper can be used as an index of the changes of form and the changes of temperature. Thinking that it might be probable that these changes might be accompanied by some sounds at the critical points, the following apparatus was constructed: A mica disk was fitted into a circular recess turned out of a piece of wood. The steel wire under examination was attached at one end to the center of the disk, at the other to a vertical post. The front of the recess into which the mica disk was fitted was furnished with two sounding tubes. On heating the wire a certain temperature was reached at which a sharp crackling sound was heard. As the temperature was increased this ceased; then, on removing the flame, at the same temperature at which the first sound was heard, a second similar sound occurred. This took place at the point of recalescence. As the wire cooled this ceased, and then, when a temperature of about 490° C. was reached, a very sharp sound was emitted. This third sound appears to take place at the second critical point observed by M. Osborn. The wire used in these experiments was steel piano wire, annealed and straightened. The last experiment was also arranged so that the steel wire when heated should be in a strong magnetic field. Repeated trials showed that the sounds produced were in no way altered by the fact of the wire being in the magnetic field.

The Micro-Structure of Steel.

At a recent meeting of the British Iron and Steel Institute, M. F. Osmond of Paris contributed a note on the above subject, and presented to the institute a series of micro photographs, which were exhibited last year at the mining exhibition held at the Crystal Palace. Very mild steel is formed of polyhedral grains of almost pure iron, in each of which the iron presents a crystalline orientation, which is constant for the same grain, but which varies in the different grains. The grains of iron appear to be surrounded by foreign matter, osrhide of iron. As the temperature is raised, the grains at first increase in size without changing their form, then they become elongated and form a group of parallel bands.

In steel of medium hardness, the white portions consist of almost pure iron, and the dark portions consist of a mixture of iron and osrhide, the "pearly constituent" of Dr. Sorby. In metal properly heated and well worked, the pure iron forms torn-up and discontinuous strips, but when the temperature is raised, the formation of polyhedral grains becomes more and more evident, until the pure iron completely envelops these grains, and grows into them under the shape of fine parallel bands.

In hard steel, the pure iron behaves in a somewhat similar manner, but it is, of course, of much less frequent occurrence. He succeeded in obtaining for this metal a photograph, which shows, when magnified, 300 diameters, the alternately dark and brilliant strips, discovered by Dr. Sorby, and considered by him to be alternate lamellæ of iron and carbide of iron. Independently of any theoretical interpretation, one fact is clearly indicated by the photographs. This is, that each preparation defines not only the hardness of the metal, other things being equal, but also the temperature at which the metal was allowed to slowly cool. Moreover, as the structure and the mechanical properties are intimately associated, it can be easily imagined, without it being necessary to enter into fuller details, to what extent microscopic investigations may furnish useful information.

MECHANICAL STRESS OF STEEL.—Some interesting experiments were recently made in England, as given in a recent number of *Iron*, which show that, in the case of uniform longitudinal strain on a steel bar, there is a strain of the molecules, also of the elements, and a production of flow by a strain of the elements.

The elongation due to flow is, he says, the strain usually observed, and this may be either recoverable or otherwise; again, the strain of an element is made up of a uniform dilatation and a uniform shear about an axis parallel to that of the bar, and, therefore, the flow elongation consists of an increase of volume, together with a certain amount of sliding. The general conclusions arrived at by the author of these experiments are as follows: Mechanical strain produces an atomic disturbance in a bar, and this disturbance increases regularly with the stress; for small stresses the disturbance is only partly permanent, but as the yield point is approached it becomes wholly permanent; finally, the magnetic properties of a loaded bar are in general different from those of the same bar unloaded; but, notwithstanding this general fact, there is a certain stress, or range of stresses, over which the bar is found to have the same magnetic properties, whether it be loaded or not.

SPECIAL MACHINERY.—Much of the success attained by our people in manufacturing says a cotemporary, has been due to their use of special machinery, but it has been mostly of the lighter and smaller class, such as is used for sewing machines, small arms, and work of a similar nature. There is evidence that those who are doing the heavier work—large stationary and marine engines, locomotives, etc., are beginning to appreciate the advantages of machines specially designed for the work they have to do, and they are having them built of the heaviest and best character. The demand for traveling and heavy swinging cranes is also constantly on the increase, and no one who is engaged in building heavy machinery nowadays seems entirely satisfied unless he has a crane which will pick up his heaviest casting—and, in fact, usually his heaviest completed machine—and deposit it wherever it may be wanted. This is making a lively demand for larger and improved cranes.

MANUFACTURE OF HEAVY GUNS.—Preparations are about to be made at the Watervliet Arsenal for the construction of the first 16-inch gun for coast defense. Such a weapon would weigh 125 tons, and with a powder charge of 1000 pounds and a projectile weighing more than a ton, would have a maximum range of about 15 miles. Forty-four of these immense guns were included in the plans of the Fortification Board, and 36 of them are intended for the defense of New York, Boston and San Francisco. They will be mounted in pairs in turrets, commanding the principal water approaches of these three ports. The first 12-inch steel gun ever made in the United States has been completed at the above named arsenal, near Troy, New York, and shipped to the Sandy Hook proving-ground for testing.

THE WATER GRATE.—The *Locomotive Engineer* observes that there have probably been 40 patents in as many years of the water grate, as used on hard-coal burning locomotives and a few that burn soft coal. To those who think that to them or some of their friends belongs the credit for the original idea, it may be of interest to look back a few years. At the Museo Borbonico at Naples, Italy, there are carefully preserved many copper and bronze tools and utensils exhumed at Pompeii, and among them a small vertical boiler of copper; this has a fire-box and smoke-flue through the top, a door on the side, and water grates composed of small tubes of copper crossing the fire-box at the bottom. Pompeii was destroyed more than 1800 years ago.

ARMORED SHIPS NOT ALTOGETHER NEW.—The first account we have of an armored ship is in 1530. It was one of the fleet of the Knights of St. John, entirely sheathed with lead, and it is said to have successfully resisted all the shot of that day. At the siege of Gibraltar in 1782 the French and Spaniards employed light iron bomb-proofing over their decks. The first practical use of wrought iron plates as a defense for the sides of vessels was by the French in the Crimean war in 1853, to be used against the Russian forts in the Baltic.

STEEL IN CAR CONSTRUCTION is fast gaining ground. A committee of the Master Car Builders' Association has reported that there are now about 15,000 tons of pressed steel on cars in the United States. Pressed steel center plates are in use on 25,000 cars. Pressed steel freight trucks are being gradually introduced, the weight being somewhat less than the diamond truck for 30-ton cars, while they are furnished at the same cost.

AMERICAN LOCOMOTIVES are in demand abroad. In the past nine months 126 of them, valued at \$1,000,000, were exported. The enterprise of our manufacturers, the genius of our inventors and the skill of our mechanics command admiration all over this wide world.

The San Jacinto Estate, where the Temescal tin is being produced, comprises 46,000 acres of land in San Bernardino county, and joins Riverside on the south. It contains, in addition to the tin-bearing land, which averages three miles wide by seven miles long, the Gavilan gold mines as well as deposits of silver, nickel, cobalt, copper and iron. There is also gypsum and fire-clay and a valuable water system is being developed, that will irrigate all of their arable land.

SCIENTIFIC PROGRESS.

Segregated Ferments for Wine.

It has long been known to scientists that fermentation, under all conditions, is due to the presence of minute organisms—that it is "the result of processes of life and vegetation in lower organisms, such as fungi and bacteria." This discovery and the methods of turning it to practical use, is due to the investigations of Pasteur. Received at first with many doubts, the matter is now universally acknowledged as a scientific fact.

The field of research in this direction is moreover constantly widening, and the practical advantages which are being derived are quite beyond computation. The microbe theory of diseases and the consequent improved modes of treatment are due to this line of research.

Among the industries, "the practical advantage of ferments is found in the conduct of the modern brewer who, instead of leaving his ferments to chance or uncertainty, makes a careful cultivation of his yeast, thus gaining complete control over his fermentations."

Wine Ferments.

What promises to be one of the most important steps of progress in this direction is its application to the production of bouquets in wines.

Following out certain views on fermentation, says a cotemporary, a French chemist and a Burgundy wine-grower thought that the special bouquets of Bordeaux, Burgundy and other wines were caused by special ferments. Seven years of patient study have proved the soundness of this view, and to-day the special ferments of a long list of wines, such as Bordeaux, Margaux, St. Emilion, Grand Champagne, Cognac, Chablis, Sauterne, Riesling, Pommard, Beaunolais and many others, have been segregated.

In 1889 the experiments were concluded, and special samples of ferments were given to about 300 wine-growers, in Algeria and France, for trial, with the result that for the vintage of 1890 ferments equal to 350,000 gallons of wine were purchased by the wine-growers, while for the vintage of 1891 ferments for 11,000,000 gallons were demanded. This lifts the matter out of the domain of experiment into the region of fact.

It is not pretended that any change can be made on wines already made or fermented; nor is it contended that with grape juice giving a bad wine excellent Bordeaux and Burgundy can be made, but the quality can be much improved and the value increased by the use of the appropriate ferment at a very slight cost.

The ferment must be added to the grapes when they are crushed. The fermentation will be found to be more rapid, complete and even, and all the sugar is fermented out, thus avoiding secondary fermentations, and the production of a mawkish and unpleasant taste. The ameliorating or improving effect will be recognized as soon as fermentation is complete, especially when a given portion is left to ferment in the ordinary manner.

All the different varieties of ferment are capable of being separately cultivated. These ferments are about to be introduced in California. George Payne, an English chemist is expected to arrive in this city in a few days, fully competent and duly authorized to introduce the ferments to our wine-producers in the various wine districts of California. It may be proper to add in this connection that our local exports do not have much faith in this new idea; but judging from what has already been accomplished in other directions, there is much reason to look for most satisfactory results in this.

SCIENCE AND PRACTICAL KNOWLEDGE.—A writer in an exchange classifies all knowledge as comprised in two classes. The first is that effect of mind which is the result of curiosity, that species of human instinct which prompts us to inquire the reason for everything we see, every action which takes place among others, among all living beings, among the elements, and among the celestial bodies. Mankind, being endowed with reason, the next impulse is to apply the knowledge so gained to some useful purpose, to produce some benefit to ourselves. The first of these two classes is called "scientific investigation," the second is called "applied science." For instance, we notice for the first time a light from which smoke arises; we investigate, we perceive heat, and that it produces a disagreeable sensation. These are the first scientific facts; we apply the knowledge so gained by resolving never to touch fire. This is applied science. We have employed curiosity to find out the facts. We now employ caution to guard ourselves against damage, and we determine never to touch fire. All knowledge so gained, is by this process. We may be told a thousand times that fire will burn, but we feel that it is only theory; we want facts, and we obtain them by a course of scientific investigation. We use these facts, and thus gain experience, knowledge, at first scientific, next practical, and these two conditions make up the sum of all knowledge. Science is the foundation, practice the superstructure.—*Ex.*

AN EXPLOSIVE MIXTURE was accidentally discovered recently by Dr. John Grant, who writes to the *Lancet* in regard to it as follows: Having occasion to make a disinfectant fluid to apply to an offensive surface on a body awaiting post-mortem examination, I chanced to

select permanganate of potash. Thinking the solution might dry too quickly and inefficiently deodorize the part, it occurred to me to add glycerine on account of its hygroscopic powers. Putting a draught of the crystals into a three-ounce bottle, I added two ounces of water and one of glycerine, and agitated the mixture. To my great surprise the cork and part of the contents were violently ejected, and the remaining portion developed great heat. Every one is familiar with the danger of mixing glycerine and nitric acid; I have not, however, seen any mention of a combination of it and permanganate of potash. I observed the mixture became brown, losing its purple color like a deoxidized solution of the salt; and as no effervescence took place, it is probable that the glycerine combined with the oxygen liberated by decomposition of the salt, and that, further, it possesses by some affinity of its own the power of producing rapid decomposition of the permanganate. Perhaps some chemist will kindly explain.

ELECTRICITY IN COLOR.—A gentleman put on a pair of woolen stockings over his silk ones on a cold winter day. At night he pulled the stockings off without separating them, and was astonished by the crackling noise and even the sparks of electricity which followed. When he drew the silk stockings out of the woolen ones, the electrical attraction was so manifest that the stockings would incline toward one another when held some distance apart. It happened that the silk stockings were black and the woolen ones of light color, but when he tried the experiment with both stockings of the same color, there was no electrical manifestation. The different manifestations were doubtless due to the difference in the materials with which the colors were compounded.

PHONOGRAPH CYLINDERS.—There are a very few who are aware of the vast number of words which can be placed upon a small phonograph cylinder by the point of the writing instrument employed for such purpose. Such a cylinder is about six inches in length by two in diameter, and yet on the authority of Mr. Edison, the entire novel of "Nicholas Nickleby" could be produced on four cylinders. If this be the fact, why may not books be published in this sort of an edition, to be read off by the machine to the purchaser, or his friends, at convenience?

THE GULF STREAM is a very interesting ocean current and has long been the subject of special study by scientists. It is now being further studied by the U. S. Fish Commission, with Prof. Libbey of Princeton in charge. The first point to be investigated is south of Nantucket, and the principal object of the expedition will be to determine the isothermal lines and the influence of meteorological conditions on these lines, with a view of studying their effects upon the migration of food fishes.

A SUBSTITUTE FOR CELLULOSE.—It is stated by *Invention* that an Austrian chemist, Herr Eokstein, has discovered a substitute for celluloid, which he has named hyaline, that is not inflammable. It is grainless, odorless, transparent, tenacious, and may be drawn into threads, or rolled into films. It is described as composed of colophony, lac, copal, Dammar resin, essential oil of turpentine and gun-cotton.

RUSSIAN SCIENTISTS are about going to Northern Africa to make a study of the methods employed by the natives in resisting the inroads of quack-sands. This inquiry is the result of ineffectual efforts on the part of Russian engineers to counteract the effect of quack-sands in trans-Caspian sections, where thousands of acres of the best arable soil are annually used up.

A BAT'S FLIGHT.—The bat is not generally known as having the power of a very long-continued, rapid flight, but Mr. William Hester of Spring Hill, Pa., has trained this uncanny bird as a carrier pigeon, so that it will fly from his place of business, one mile from his home in 28 seconds.

THE ACADEMY OF SCIENCES of France has admitted a new system of musical notation in which 27 characters replace the 203 symbols now employed to represent the seven notes of the gamut in the seven keys.

POLAR RESEARCH.—It is a mistake to suppose that polar research has cost enormously in human life. Despite all the great disasters, 97 out of every 100 explorers have returned alive.

THE LOWEST SOUND the ordinary ear can detect has been made by 990 vibrations, while the highest tone will consist of 2,228,000 vibrations.

THE ORANGE.—It is said that the orange was originally a berry, and that its evolution has been going on more than a thousand years.

WHEN Herschel studied astronomy, only four double stars were known. Now nearly 7000 of them are distinguishable.

SAN FRANCISCO COINAGE.—During the month of June double eagles to the value of \$1,660,000 and standard dollars worth \$1,000,000 were coined in the San Francisco Mint. The coinage for the fiscal year ending June 30th amounted to \$31,212,292, divided as follows: Double eagles, \$21,650,000; standard dollars, \$9,350,373; dimes, \$211,919.

ELECTRICITY.

THE PROFITS OF ELECTRICAL WORK.—In no other department of scientific or industrial research have explorers derived so much profit as in the electrical line, and no scientific body in the country has so many millionaires as the American Institute of Electrical Engineers. At the top of the list is Alexander Graham Bell, whose profits on the telephone are represented by eight figures. Next comes Edison with a seven-figure fortune. Brush, of electric-light fame, and Elihu Thompson, whose financial future is perhaps brighter than any of the others just now, are more than millionaires. Frank J. Sprague was a junior officer in the United States Navy six years ago. He is now flying in the mansion which was built for the Grants. His company sold out to the Edison Company for \$1,000,000, and half of it went to the inventor. Franklin L. Pope of New York and a score of others have independent fortunes. Most of these men were telegraph operators, and most of them began their experimenting and study without a dollar. So says the *St. Louis Globe-Democrat*.

ELECTRICITY IN THE MANUFACTURE OF PHOSPHORUS.—We have already made allusion to the fact that electricity is now used as an agency in the manufacture of phosphorus. A contemporary says the ordinary method of obtaining phosphorus involves elaborate chemical treatment of the materials from which the finished phosphorus is produced before they can be subjected to the action of heat. In the new process, which is now at work upon a commercial scale at a factory recently erected at Wednesfield, near Wolverhampton, England, the electric current is conveyed to the furnace and melts the various ingredients, the phosphorus being deposited in nearly a pure condition; only very little refining being required. The process is stated to be much cheaper than the ordinary method. This is the first attempt to produce phosphorus by electricity upon a commercial scale. The estimated consumption of phosphorus throughout the world is about 2000 tons per annum.

MODERN PROGRESS.—Prof. Elieha Gray remarks that electrical science has made a greater advance in the last 20 years than in all the 6000 historic years preceding. More is discovered in one day now than in a thousand years of the middle ages. We find all sorts of work for electricity to do. We make it carry our messages, drive our engine, ring our door bell and scare the burglar. We take it as a medicine, light our gas with it, see by it, hear from it, talk with it, and now we are beginning to teach it to write. What will it not yet be doing for us?

TO MODIFY THE ELECTRIC LIGHT.—The brilliancy of the incandescent electric lamp is often a serious objection to its use, and a very simple method of modifying its dazzling glare has been suggested. All that is necessary is to dip the glass in a saturated solution of alum and water, and then apply, when dry, a coat of collodion as a protection. This is said to make the light very soft and agreeable, even to the most sensitive eyes.

CHEAP TELEPHONES.—Residents of Stockholm, Sweden are charged only \$2.75 a year for the use of a telephone instrument, with but 2½ cents for each call. It is to be hoped that the cost of telephone service in this country will soon be reduced to a reasonable figure, so that our people can more generally enjoy the privileges of this now almost indispensable business and social adjunct.

LUMINOSITY OF THE ARC LIGHT.—Prof. Elihu Thompson corrects the popular impression that luminosity of arc lamps is due to heated carbon particles. He says that, although there is a steady stream of carbon vapor between the carbons, yet the light is nearly all derived from the enormously heated surfaces from which the evaporation takes place.

CARBON POINTS FROM NATURAL GAS.—Two chemists are reported to be experimenting at Freeport, Pa., with the object of producing carbon points for electric lighting from natural gas. It is said that by burning the gas in a specially prepared furnace pure carbon is obtained, but as yet at a cost too great for practical purposes.

A NEW MOTOR ARMATURE.—Simply a piece of Norway iron of the best quality, and no wire at all, constitutes the armature of a motor just brought out by Mr. W. S. Richards of Boston—said to be quite efficient.

THE WEATHER BUREAU.—The United States Signal Service closed its labors on the last day of June. General Greely is now the head of a purely military staff corps, while the Weather Bureau is a part of the Department of Agriculture, with Prof. Mark W. Harrington of Ann Arbor in charge. General Greely has been in the signal corps since 1871. He constructed telegraph lines in Texas, Dakota and Montana until the scientific societies nauted in sending expeditions to the north polar region. Lieutenant Greely was put in charge of the American party, and was absent three years. On his return, he was made a captain, and later, when Gen. Hazen died, was made Chief Signal Officer, a position which carried with it a Brigadier-General'ship. He is now Commander of

the Military Signal Corps. Prof. Mark Harrington has been all his life a scientist and naturalist. His is known as a botanist, as an astronomer, as a mathematician, and as the editor of the first meteorological journal issued in this country. Hereafter all those engaged in the Government's meteorological work will be civilians, from the head of the bureau to the novice in the service.

SHOP NOTES.

The Little Shop.

The blacksmith and woodworker in the little village shop looks upon his business as a mere incident to the great shop where hundreds of men are employed. Ambitious to make more of a mark in the world, he not unfrequently sells out his little business and seeks for a better one in a larger town, successful in some instances and unsuccessful in others. It is always a justifiable ambition to improve one's condition, but the man who fills a position, no matter how humble it may be, is entitled to all credit and deserves more than he whose ambition carries him beyond his ability to fill it.

The little shop is more than it appears to be; it not only supplies the surrounding community with the needed conveniences for new work and repairs, but it is more than this; it is the primary school where the boys learn the A, B, C of this business, and through its little doorway pass the mechanics who afterwards make their mark in the larger shops.

Boys learn trades in the larger shops, but we risk nothing in the assertion that a very large percentage of superintendents and foremen are men who began their trades in the little shops, particularly in the blacksmith and woodwork branches.

It may be hard and not particularly agreeable work to labor in the little shop, making repairs and odd pieces of new work, but it is instructive and tends to set a boy to thinking of things that would never receive the least attention in the larger shops; it broadens his mind and encourages study in all departments of his business. A boy may and will learn his trade in a large shop, but unless he is ambitious he will learn one department only. As a blacksmith he may become an expert on road wagons or other vehicles of that kind, but beyond the one kind of carriage, he will learn nothing. So too in the wood shop; the work he begins upon he adheres to, as in both cases there is more money to the journeyman at the time than though studying up other branches.

We say then to the man who has a small shop, don't be ashamed of your business, increase it if you can, but don't drop the apprentice system. It pays to teach a boy the trade, and the trade needs just such a line of mechanics, boys who have been taught the general principles, to enter large shops and complete their education, and furnish competent men to take charge of large establishments. Ninety per cent of men who have become successful manufacturers began their trade in the little country shop.—*Blacksmith and Wheelwright*.

WE CAN NEVER KNOW TOO MUCH.—In a small shop, a machinist is often sized up by his ability to "rig up" for jobs too big for the shop or its tools. The man who "rigs up" the best, usually has the best ideas regarding other things. In other words, he is in the habit of thinking about his work. Everything that can be thought of pertaining to the proper condition of every machine in a shop, or to the proper way to do an odd job, should be carefully studied out. Not only a beginner, but every journeyman in a shop should read up everything he can get and find time to pursue that relates to his business. Every man who desires to make a success in business should make it a constant study to improve himself. He can never know too much.

A HINT FOR A FOREMAN.—One of the good points that should be seen in a foreman is the ability to look ahead and see what is coming and have all the difficulties provided for as fast as they appear. It is something like a man laboring under a heavy-loaded wheelbarrow; you can help him about as much by knocking out the little trigs and obstructions that are likely to come before the wheel, so as to make all smooth work for him, as you can by seizing hold of one arm of the barrow and rushing recklessly over everything by main strength.

A READY WAY TO COOL A HOT JOURNAL IN MACHINERY that cannot be stopped is to hang a short endless belt next to the box, and let the lower part of it run in cold water. The turning of the shaft carries the belt slowly round, bringing fresh cold water continually in contact with the heated shaft, and without spilling or splashing a drop of water.

A SUBSTITUTE FOR EMERY IN GRINDING has been found, it is said, in crushed steel. Highly tempered steel is heated and plunged into water. This renders it so brittle that it can be pulverized, and in this shape it has been found to do the work of emery better than the genuine article.

LINE SHAPING should never be placed along the side of a room so that all the machinery will be belted from one side. Equalize the strain on the shaft by placing the machines on both sides. For this reason the shaft should be run through the center of the room.

USEFUL INFORMATION.

ANCIENT AND MODERN FELTS.—An illustration of the intimacy of the most modern and most ancient of civilizations is found in the fact that it was left for an American citizen to first successfully essay the mechanical fabrication of felted cloths. Thos. Robtson Williams of South Kingston, R. I., invented the process of making felted cloths of commercial length, and patented it May 22, 1830. Since that day felts have appeared in innumerable forms—as plumed and embossed piano cloths, ladies' skirts, floor coverings, often with highly artistic designs, material for roofs and protectors against weather, piano hammers, shoe linings, etc. It is difficult to imagine any department of industry in which wool, in its felted form, does not somewhere play its part. Thus we have taken the simple discovery of antiquity and made it among the chief instrumentalities of civilization. The Tartars and kindred peoples who occupy the middle and northern regions of Asia, and whose manners and customs have remained unchanged from the most remote antiquity, employ the felted wool in a variety of functions, only less important than the supplying foods. Both their clothing and their habitations have consisted of felt since a knowledge of them first went upon record in the fourth century. The process of felting was generally known among ancient nations. The Greeks gave to it the name *piledia* from *pileo*, to compress; literally a compression or thickening of the wool. The ancients employed felt for a great variety of uses, just as we do, the chief being to make coverings for the head, the most common form among the Greeks and Romans being the skull cap.—*Popular Science Monthly*.

A NEW USE FOR WASTE GLASS.—A new use has been found for waste glass by Messrs. Rostaling, Garchey & Gelle, of Paris. Any fragment of broken glass of various colors are mixed together, after having been broken to a suitable size, they are then placed in molds lined with silica, talc, or some other resisting material and fired. A coherent mass is produced which can be dressed and cut into blocks, which are, of course, irregularly colored. Such blocks may be used as artificial marble. The blocks are usually rough on one side, owing perhaps to incomplete fusion; this gives a surface which is admirably adapted for causing them, especially if they are slab-like in form, to adhere to walls with the addition of a little mortar. Fine decorative effects can thus be produced. Designs in relief can be obtained by pressure while the block or slab is still plastic. If a suitable mold be prepared with movable partitions, then pieces of glass can be arranged in such a way that, upon firing, a very effective "stained glass" window is produced, the necessity of using "leading," as in the ordinary way, being thus obviated. This idea will enable many manufacturers, who have heaps of "waste" glass lying about useless, to turn them with very little expenditure to profitable account.

SYRUPS THAT WILL NOT FERMENT.—If 10 per cent of alcohol is added to the water with which the ingredients are to be extracted, the syrups will not ferment. The best proportion of sugar to the liquid is as follows: Syrups made with a more or less alcoholic menstruum, three parts of sugar to every two parts by weight of liquid; syrups made with water alone, five parts of sugar to three parts by weight of liquid; fruit syrups, nine parts of sugar to five parts by weight of liquid.

SILVER IN BELLS.—A writer in an English scientific journal says with regard to the practice of putting silver with the other metal when a bell is to be cast: "I once asked a foreman in a well known bell foundry whether putting silver in a melting pot was of advantage. He replied, of great advantage—to the founder—as the silver sinks to the bottom; the founder pours off the copper and tin, and when the silver has cooled, puts it in his pocket."

GUN BARRELS.—The only proper way to keep a gun barrel in good order is to wash it out with boiling hot water, dry with linen swabs and oil with vasoline or cylinder oil, every time that it is used. It should never be laid aside unattended to for a day or two after firing.

IRON POLISHING.—Small articles made of malleable iron are now finished and polished bright by being placed in revolving drums with curriers shavings, from which they emerge with all of the rough edges smoothed and the surface highly polished.

A REWARD.—A German capitalist has offered a reward of \$25,000 to any astronomer who can satisfactorily prove to him that the sun, the moon, or any one of the stars is inhabited, or that it contains any solid matter whatever.

IT WAS SUCCESSFUL.—A Georgia teacher who could not teach one of her young pupils to remember the letter H, cut one of the letters out and made him swallow it. This had the desired effect.

PUT CAMPHOR GUM with your new silver ware, and it will never tarnish as long as the gum is there. Never wash silver in soap suds, as that gives it a white appearance.

GOOD HEALTH.

The Eyesight of Coal Miners.

Dr. J. Court of Staveley, England has recently made a report upon a series of investigations as to the effect of safety lamps upon the eyesight of men engaged in coal mining. The investigations were carried out in the Derbyshire collieries, a number of men working with safety lamps and a number using naked lights being examined. It was found that out of 524 persons using safety lamps, there were 164 afflicted with nystagmus (which consists of a peculiar oscillation of the eyeballs), 127 had night blindness, and 61 photophobia. This clearly proves, Dr. Court states, that there is a serious amount of disease, and is in striking contrast with the disease found among the 573 miners using naked lights, of whom only 32 had nystagmus, one had photophobia, and 12 night blindness. This difference is made greater still when it is borne in mind that, out of these 32 cases of nystagmus, 29 of the men had previously used safety lamps, and the one man with photophobia and 11 of the cases of night blindness had also been employed in mines worked with safety lamps. In other words, of the 544 men who had always used naked lights, there were only three who had nystagmus, and they worked with candles.

Among the torchlight men, 228 in number, there was not a single case. Dr. Court holds that the insufficient light of the safety lamps is the chief if not the sole cause of nystagmus, night blindness and photophobia. The remedy proposed by him is that a light should be found that would be greater in quantity and with less shadow than there is in the Marsaut and similar lamps. At first he thought the position of the men in working the coal was one of the chief causes of nystagmus, but his inquiries have convinced him that it is the want of a good light that is the only cause of the mischief.

WHISKY AS AN ANESTHETIC.—I have for some years past been advocating the use of whisky as an anesthetic in certain surgical operations," remarked Dr. I. Love of St. Louis to a group of interested auditors in the Arlington rotunda. "I recall to mind a ludicrous incident in this connection that occurred in my practice only a few days since. A negro came into my office and asked me to operate on a felon. 'Fore God, doctor,' he exclaimed, 'don't hurt me; I'm dreadful 'fraid of pain.' 'Joe,' said I, 'I will cost you \$5 to give you chloroform, but I have something that will put you to sleep and you won't feel the operation, and the whole job will only cost you \$1.' I then took a half a pint of whisky and divided it up into three doses, and ordered him to take them with a half hour intervening. Along in the evening I got into my carriage and drove to the negro's cabin and knocked at the door. The only response was loud snoring. I pushed the door open and found that my patient was not only sound asleep, but was alone. I took the hand afflicted with the felon, unwound the rag and proceeded to cut open the thumb. The only sign of consciousness was when the knife struck the bone, when he gave a most tremendous snort and a jerk of the arm. I fixed up the wound nicely and laid the arm on his breast, and on taking hold of the left hand to arrange it also, I found, tightly clutched, a dollar bill. I relaxed the fingers, took out the bill, put it into my vest pocket and withdrew, leaving my patient still snoring as loudly as ever."—*Globe-Democrat*.

POINTS FOR THOSE WITH POOR TEETH.—Abscessed teeth, especially in the back of the mouth, and more especially in the lower jaw, should not be left in the mouth after a reasonable amount of skillful treatment has failed to control the discharge of pus. Chronic abscesses discharging pus, which is swallowed with the saliva, are too frequently allowed to pass unnoticed, and serious derangements may arise from this constant assimilation of a septic poison. If the abscess cannot be cured, extract the tooth. As to when to extract teeth, I have only to say that once it is decided to have the teeth removed, the sooner it is done the better. If it is designed to take gas, the dentist should not be visited immediately after a meal, as the presence of food in the stomach is likely to result in nausea and vomiting, which is unpleasant for both the patient and the operator. Take gas on an empty stomach.—*A Dentist in N. Y. Herald*.

THE PULSE.—A physician who kept a nightly record of his pulse for five years, reports that every year it falls through the spring until about mid-summer, and then rises through the autumn to November or December. Then comes a second fall and a second rise, culminating in February.

HABITUAL DIVERS in salt water often have inflammation of the eyes. The exposure such diving necessitates is not beneficial.

LEAD ORES FROM MEXICO.—The Collector of Customs at El Paso, Texas, in an interview in regard to the charges of fraud made by several Western papers, in the admission of lead ores from Mexico, says fraud is impossible, owing to the system of checks upon importations.



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SAN FRANCISCO:

Saturday, July 11, 1891.

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Business Announcements.

[NEW THIS ISSUE.]

Mining Expert—John C. Cox, Santa Rosa.
Capital Wanted—John Cameron, Santa Rosa.
Boiler Scale Fluid—The Dowdle E. B. S. F. Co.

See Advertising Columns.

Passing Events.

The cause of the flood in the Colorado desert proves to have been what was expected—merely a break in the Colorado river, which has been running very high for some time. A heavy body of water is still running into the sink at Salton, and salt mining has been necessarily stopped for the present.

A few days ago the Supreme Court decided that the purchase of mining stock on a margin was illegal, and that a suit instituted to recover any security given for the purchase of stock under such conditions has no standing in court. This is a heavy blow at the Stock Exchange business, especially since a rehearing has been refused.

The drafts of a number of miners from the Idaho mine at Grass Valley would seem to indicate a near close to the long and prosperous career of that famous mine. Still, aside from this, the mining interests of Nevada county are in a more prosperous condition than has been the case since the closing down of the hydraulic mines.

Stocks on Margin.

In another column is printed the main points brought forward by the San Francisco Stock Exchange's lawyers in asking for a rehearing in the now famous suit of Cushman vs. Root, the particulars of which we have heretofore given.

To say that the denial of the Supreme Court for a rehearing was a surprise to stock-brokers is a tame expression, for great confidence had been felt that the court would grant it. The case now goes to the Superior Court for retrial, when able counsel will represent the stock-brokers with the hope of securing a contrary decision to that recently rendered. Whether they will succeed is a disputed question, one on which able lawyers are said to differ; but, so far as we can personally learn from disinterested lawyers that have given the subject attention, it will be hard to have the decision reversed. They one and all are agreed that the Constitution forbids the dealing on margin, but they do not interpret this as meaning that brokers cannot loan money on stocks in a legitimate business manner. By "in a legitimate business manner" they say means when the stock has been actually purchased and a transfer made to the buyer by having the certificate of stock made out in his name. This shows ownership, and no law can prevent any person, desiring, from loaning money against the stock, and if its market value goes down so that a loss is met by the person or broker loaning the money, he can sue for and recover the sum due. But where a purchase of stock is reported and no transfer made, then the person or broker who reports the purchase and carries the stock on a margin has no recourse if, in a declining market, a loss is incurred.

We take it that this is a reasonable and a business view of the case. For in all other business when a purchase is made a transfer of ownership, to make it legal, has to be made, and no written agreement to the contrary unless recorded, will hold, and even then it is doubtful if the latter will hold unless a transfer of ownership is made. In stocks a transfer of ownership is acknowledged when the certificate is made out in the buyer's name, and a record of the same made in the company's book.

The feeling among mining men, those who wish to see the industry placed on a business basis, is that the courts declaring margin trading illegal, will do no little in doing away with the spirit of gambling with which the stock boards appear animated, and bring in a class of buyers who operate largely for investment, yet who are large traders on the market, and it is these that give tone and standing to the business and cause good prices to obtain. Since stock dealing has largely degenerated to more or less of a gambling character, it is with difficulty that prices can be advanced, and even when they are sent to higher ranges of values there is no stability, and they fall at such a break-neck speed as to swamp all who bought and lessen year by year those who deal.

There is another and important view to take of the decision, and that is by making stock-dealing partake more of a legitimate business character. It will unquestionably do away with the listing of the shares of "wild-cat" mines on the two exchanges, for the class of operators who will come into the field when stock-dealing becomes legitimate will operate only in the shares of those mines that have a reasonable prospect of being developed into a dividend-paying proposition. There are too many so-called mines whose shares are now listed that have nothing more than a prospecting hole sunk so as to locate and hold the claim, and the managers of which never entertained any other idea than to sell the stock on a boom in the mining share market. The weeding out of such stock by the two exchanges will do great good to the mining industry and not bring it into so much disrepute as is now the case.

ZINC ORES.—The census gives the following statistics of zinc ores in 1889: Missouri, 93,131 short tons; New Jersey and Pennsylvania, 63,339 short tons; Kansas, \$30,575; Wisconsin, 24,832; Virginia and Tennessee, 12,906; Iowa, 450 short tons.

ROBERT McMURRAY, the well-known mining man, is in Chicago on business connected with the World's Fair.

The onyx beds at Cave Creek, Arizona, are being opened up properly.

California Iron.

Advices from San Diego this week state that the \$290,000 bonds for the establishment of an iron plant has been raised and Dr. C. J. Eames, the promoter of the enterprise, will commence work at once. It is proposed to put up a plant with a capacity of 100 tons per day, to be worked on the direct process.

The iron ore is to be obtained in San Bernardino county. Its quality is unsurpassed; very high in iron and low in phosphorus and sulphur. For fuel, lignite and oil are to be used. There is no good coal in the southern part of the State, but there is plenty of oil. Dr. Eames tells the San Diego Sun that he expects to be able to convert 36,000 tons of bloom per year into merchantable iron at San Diego. There is a vast difference between a blast furnace and the direct process. For the direct process a manufactory can be built in three weeks for \$100,000.

Dr. Eames says: "I know that by erecting a steel addition to the iron plant here we can make 'open hearth' steel, from which can be turned nails, tools, machinery, etc. The 'bloom' will make merchantable iron, and the 'open hearth' steel will make boiler plate, armor plate, axles, sheet iron, etc. A 30-ton furnace for this 'open hearth' steel will cost \$35,000, and three heats of 15 tons at each heat can be turned out every 24 hours. The iron ore here will make magnificent steel, and the merchants will buy the goods and the farmers will buy the tools manufactured on this coast in preference to any other on account of their superior quality."

Oregon Gold Mines.

Mr. Alfred L. Correy of Baker City, Oregon showed us a number of specimens of gold and silver ore from that region this week. Mr. Correy informs us that the outlook for the mining country around Baker City is very bright indeed, and that many mines are being opened. There are 25 quartz mines in full operation near the city, discharging some \$20,000 per month for labor; and in the various other camps of Baker county, prospecting and development work are going on.

Baker City is on the banks of Powder river, in the heart of a rich mining and agricultural region. The Powder River valley is 16 miles wide and 20 miles long, at an elevation of about 3000 feet above sea level. The city is on the main line of the Union Pacific, 357 miles east of Portland.

The Crocker Creek district, where there are some very prominent mines in which large capital has been invested, is a rapidly developing region. Experiments are being made with the McArthur-Forrest process, as the ordinary milling process has not been successful on some of the ores of the larger mines.

The great Seven Devils district, on Snake river, is only 75 miles northeast of Baker City. Sanger, Sparta and Cornucopia, on the north, are all flourishing camps. The Baker City quartz region is now only in its infancy, and although they experienced some difficulty in saving all the gold in the ore, this is expected to be overcome.

THE CON. California and Virginia mine yielded last month, from 10,250 tons of ore, \$279,177.74, of which \$125,112.84 was gold and the balance silver. The average yield in hullion per ton was \$27.23, of which \$12.20 was gold and \$15.02 silver.

THE PRESS CLUB of San Francisco gave a reception on Saturday evening, July 11th, to Mr. and Mrs. O. Black. The committee having the affair in charge is composed of E. W. Townsend, Wm. N. Hart, E. F. Moran, Walter B. Cook and Mark Thall.

PRESIDENT VALENTINE of Molders' Union No. 164, has resigned and gone East to enter on the duties of his salaried position as Vice-President of the International Molders' Union. D. Gunn has been elected President of the local Union.

THE output of lime in California is about 300,000 barrels a year, worth about \$450,000. There are 500 men employed at the kilns and quarries.

OFFICIALS of the U. S. Geological Survey are at work in Plumas county pursuing their investigations on the gold belt of California.

The Lake in the Desert.

The water has continued to rise in the new lake at Salton, Colorado desert, San Diego county, but there is said to be no danger to the railroad track, although the salt works have been temporarily abandoned. One may now go in a boat over the fields where the salt was formerly gathered. It is proved that a heavy current of water is running into the desert from the Colorado river, and the new channel is both wide and deep. Engineers are now out making a survey of the situation. Advices to the Southern Pacific Co. state that the water leaves the Colorado river about eight miles from El Rio, and flows through several channels from four to six feet deep and from 30 to 40 feet wide. It flows westward along the sandhills and on the line of the old stage route through the Alamo Locho station. The channels there join, making a stream about 100 yards wide or more, and having a velocity of four miles an hour, and gaining. It was too deep to get the depth, but the old slough at that point was formerly 20 feet deep. This is about 35 miles from the river.

The source was followed about two miles farther in the direction of Indian Wells. The water all the way was from half a mile to two miles wide, and from two to four feet deep, having a velocity of two miles per hour. The main channel passes Cook's Wells, Seven Wells, Gardner Station, or Butt Station, then on to Alamo Mingo, making a distance of 52 miles from the river. This is the point it enters the desert for Salton. The old stage route, with the exception of five or six miles, is all covered with water. The only way to reach this point is over sandhills and mesa.

This message was received by Superintendent Muir from Richard Quinn, one of the party sent out from Ogihay as a preliminary expedition to make an examination of the country on the south side of Salton basin.

A curious fact in connection with this flood is that the Colorado river is daily falling, yet the volume of water in the sink is on the increase. It seems odd that this filling-up of the desert with water from the Colorado river should occur in this way, when for years men have advocated the assistance of Congress to this end.

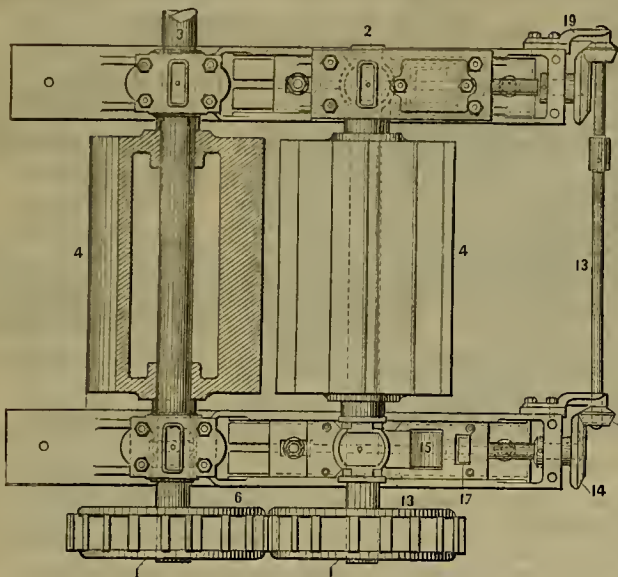
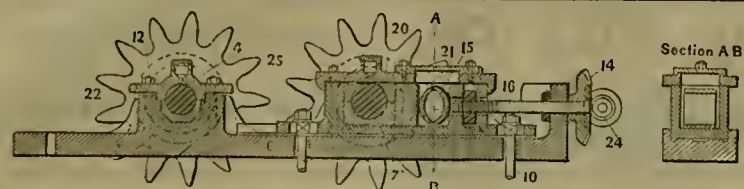
The late O. D. Wozenrath of San Bernardino, for many years agitated the subject of turning the river into the desert, and endeavored to get the assistance of capital and of Congress. The idea was to moderate the climate of the surrounding region, and make available lands, then worthless from their aridity and distance from water. Nature has taken the matter in hand herself without the assistance of engineers, and is filling up with water the deeper basin of the desert.

Machinery for Breaking Coal.

In the PRESS of June 27th were given views of the gyrating screens used for sizing coal at the Cross Creek collieries, Pa., as described before the American Institute of Mining Engineers by Eckley B. Cox. On this page are shown the rolls used for breaking the coal. There are two methods of doing this. When the lumps are large and the pieces of slate attached to them are of such a character as to render it economical, the larger lumps are broken by hand, the men using picks made for that purpose, but by far the larger portion of the breaking is done by rolls.

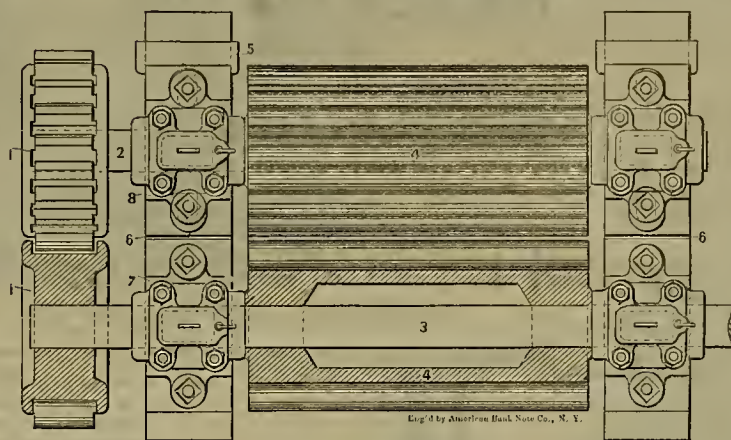
Those used at the Cross Creek collieries differ in one point from those generally adopted. The difference is in the form of the teeth. The rolls used are known as corrugated and the teeth are continuous from one end to the other. There are no points. The end of the tooth is slightly rounded, so as to give greater endurance. The principle upon which these rolls act may be explained as follows:

In the operation of a roll, as ordinarily constructed, i. e., with pointed teeth, the point of one of the teeth inserts itself into a lump of coal, which is passing through the rolls, and breaks it very much as the stroke of a pick would do; that is, the lines of fracture radiate approximately from the point where the tooth strikes the lump of coal. If two pieces of round iron are placed parallel to one another, and at such a distance apart that a piece of coal



6 0 6 12 18 24 30 36 42 48 Inches.
1/2 Inch = 1 foot.

FIG. 1.-ADJUSTABLE CORRUGATED ROLLS.



3 0 3 6 9 12 15 18 21 24 Inches.
1 Inch = 1 foot.

FIG. 2.-FIXED-DISTANCE CORRUGATED ROLLS.

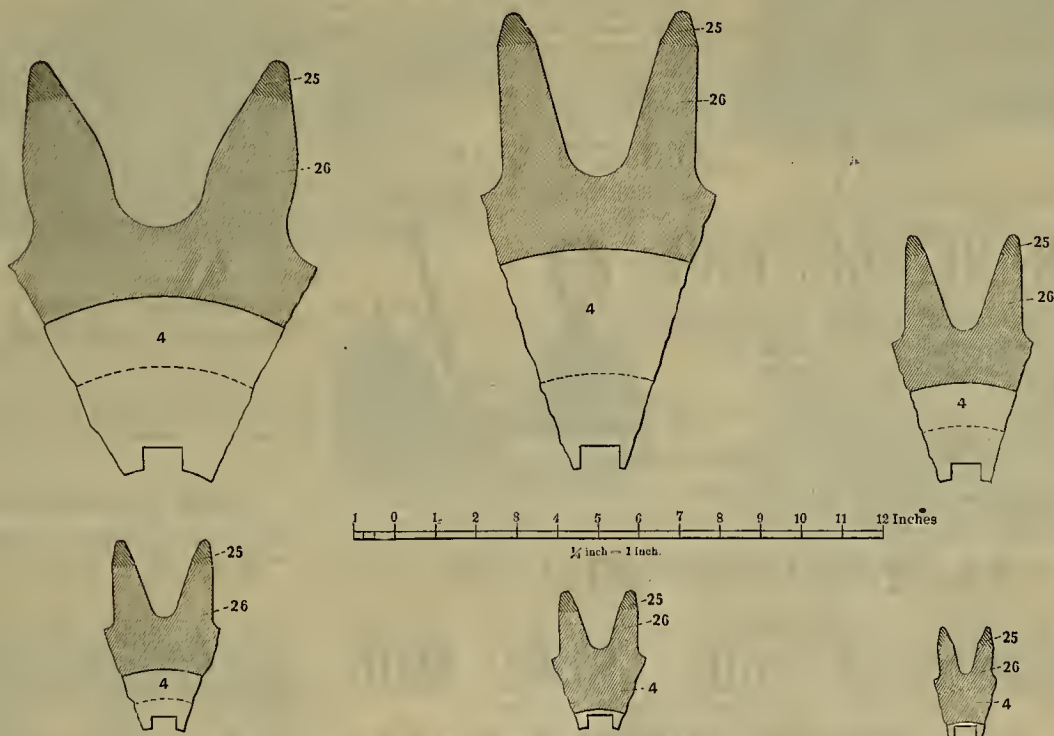
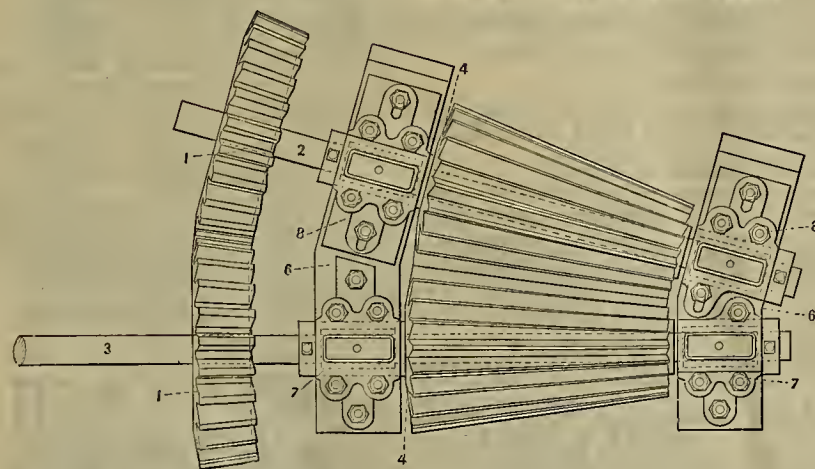


FIG. 4.-SECTIONS OF ROLL TEETH.



3 0 3 6 9 12 15 18 21 24 Inches.
1 Inch = 1 foot.

FIG. 3.-TAPER CORRUGATED ROLLS.

will just be supported by them, and if a third piece of round iron, placed midway between and in a direction parallel to and above the other two, is then brought down upon the coal the piece of coal will break near the middle like a piece of wood subjected to a load in the middle too great for it to bear. The result of this action is generally to break the lump into two pieces of nearly the same size. This is the result sought to be attained with the corrugated rolls, and it is for this reason that the plan referred to below, of breaking from one size as far as possible into the next size below, has been adopted.

One size of rolls is used for breaking lump into steamer, another for breaking steamer

into broken, another for breaking broken into egg, another for breaking egg into stove, a fifth for breaking stove into chestnut, and a sixth for breaking chestnut into pea coal. Experiment has taught that, although all sizes below the size which is being broken are always made, yet the most economical method is to break any size as nearly as possible into the size immediately below it; in other words, that it is more economical to break your lump as far as possible into steamer, then break your steamer as far as possible into broken, your broken into egg, and so on; of course, at each time eliminating all the coal below the size that you wish to break, before passing that size through the rolls. If a piece of any size

is simply broken as nearly as possible in two, for the next size, the amount of small coal made is very much less than if the same piece were struck near the center with a pick and broken into a number of fragments. The old practice, which has not entirely disappeared, was to arrange the rolls in such a manner that by putting them farther apart or closer together, they could increase or decrease the quantity of the larger sizes of coal. But where arrangements are made to break the sizes successively, it is not necessary to change the distance between the centers of the shafts of the rolls after the proper distance for most economical breaking has once been determined.

Fig. 1 is a drawing of the large rolls which is used for the lump and steamer. In these, as will be observed, there is an arrangement for changing the distance between the rolls while they are running (when this change is great, it is necessary to use gear-wheels of greater or smaller diameter), and also a breaking-piece (15) which would be crushed in case a piece of rock or iron should go through the rolls. The bending of the shaft is thus avoided. This disposition of the bed-plates is well known, and has been used for many years. It was originally designed by Mr. David Clark of Hazleton, and is described by Mr. H. M. Chance in volume "AQ," "Second Geological Survey of Pennsylvania." Plate 2 shows the style of bed-plate used for all rolls smaller than steamer-rolls. In this case the pedestals are fixed, and when it has once been determined what is the proper distance between the shafts, no arrangement is made to change their relative position, except by changing the keys which regulate the distance between the pedestals. Plate 3 shows a set of taper-rolls, which are used where a small quantity of a number of different sizes is to be broken up at once. At the upper or larger end the rolls will take steamer; a little farther from the end they will take broken; a little farther, they will take egg; and a little farther, stove. When the coal to be broken is of different sizes, and the quantity not large, these rolls may be economical; but the tendency of practice is to increase the number of rolls, having a different roll for each size to be broken. Plate 4 shows the cross-section of the teeth and a portion of the body of the roll. The largest is the lump-roll, the second is the steamer, the third the broken, the fourth the egg, the fifth the stove, and the sixth the chestnut. Of course it is not usual to break up either stove or chestnut-coal except when it is very flat, and therefore not marketable, or stony. In this case it is broken up into smaller sizes and prepared by jigging, etc.

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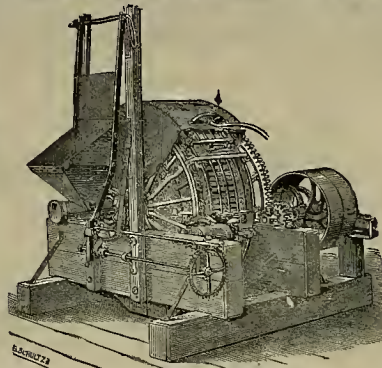
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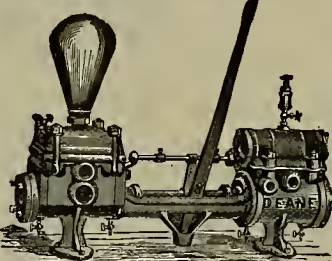
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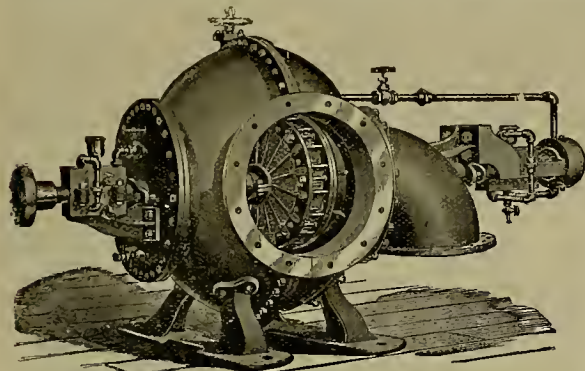
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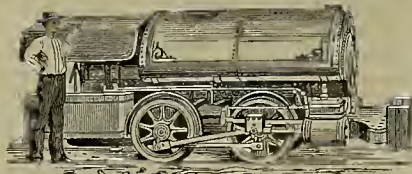
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Market Review.

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SAN FRANCISCO, July 9, 1891.

Although business is quiet, yet the generally expressed opinion is that more active times will be witnessed this fall, than for several years past. At present there is, in some quarters, an undefined feeling of fear, as if something is pending of a disastrous character, no doubt this is generated by the heavy gold shipments (aggregating since January 1st, 1891 over \$70,000,000) from this country to Europe, but this fear ought soon to give way, under an easy growing money market at the East. The disbursements in this month in the cities of Boston, New York and Philadelphia aggregated over \$12,000,000, this is independent of the disbursements in other money centers. All information warrants the assertion that at the East there will be a speculative craze within a few months. This opinion is grounded largely upon the movements of the different railroad managements. The railroads are generally charging more for traffic service, while they are not buying one-quarter of the rails they usually purchase—this means a saving of funds for a big showing. England sold nearly all its American securities and America bought, now we will have to sell and at a good profit. This can be done under big returns from the leading railroad lines.

In this city large sums of money are being disbursed, and although large sums will be required to move the grain crops, yet no friction is looked for.

QUICKSILVER—Receipts the past week aggregate 271 flasks. The market shows more strength in sympathy with an advance at the East.

MEXICAN DOLLARS—The last steamer for China took out slightly over \$100,000. The market is steady at 80¢@81¢. The stock here is not large.

SILVER—Mint purchases so far in this month are as follows:

Date.	Offered ounces.	Purchased ounces.	Price paid per ounce.
July 1.....	944,000	500,000	\$1.0125 to \$1.0225
" 6.....	630,000	1,0135	to 1.0149

The silver market has hung around at about \$1 or per ounce. The offerings on this coast are fair. It is reported that many odd and end parcels are being sold at the East and also on this coast, owing to holders fearing another drop in prices. The surplus in this country is being steadily absorbed, and it now looks as if the Government purchases will soon be confined to the mines current output, and when that takes place, much higher prices are reasonably certain. The stock of silver hulsion in Europe is light, barely enough to meet current trade requirements. The wisdom of our Government in buying 4,500,000 ounces of silver a month, is shown in the recent heavy exports of gold from this country, if we had not added so much money to our circulation, the large exporting of gold would have brought on a big panic.

BORAX—Receipts the past week aggregate 237 cts. The output of the various companies, appear to be controlled, so as to keep the markets within a reasonable range of values.

LIME—Receipts aggregate the past week 2472 bbls. The coast demand is said to be larger than at this time in 1890.

TIN—Imports the past week aggregate 8220 boxes of plate by railroad from the East. Pig is dull and heavy. In plate the market bears every evidence of uncertainty. It now looks as if prices will shade off, at any rate canners and tanners do not care to buy beyond immediate wants. The stock in this country is very heavy.

LEAD—The market has a strong tone, yet business is restricted to actual requirements. The consumption on this coast is said to be larger than at the like time in 1890. The East reports a strong market, with the demand being for actual use and not speculation.

IRON—Imports the past week were 84 tons from Oregon. The market is quiet, but fairly steady. The advance in freights from England, is accepted as a favorable sign. The consumption on this coast is quite free.

COAL—Imports the past week aggregate as follows: Departure Bay 3388 tons, Swansea 2400, Tacoma 2450, Sydney 2491. Total 10,729 tons. The market shows considerable strength. Importers report ships asking more money for freights from both Australia and England, but this is not apt to continue long for the exceptionally large wheat crop on this coast must cause more vessels to head this way, and in coming they will bring coal if to be bad. Outward wheat charters from this port are higher. The labor strikes up north are in a fair way of being settled, or at least, so far controlled as to allow of non-union miners going to work. The spot coal market has a strong tone.

Coal and Coke.

SPOT FROM YARD—PER TON.	TO LOAD—PER TON.
Wellington.....	9 00 Australian.....
Greta.....	8 50 Liverpool S.M.....
Carbon Hill.....	8 00 Scotch Splint.....
Nanaimo.....	9 00 Cardiff.....
Gilman.....	7 50 Lehigh Lump.....
Seattle.....	7 50 Cumberland bk 10 00
Coos Bay.....	0 00 Egg, hard.....
Cannel.....	9 50 West Hartley.....
Egg, hard.....	14 00
Cumberland, in sacks 14 00	
do, bulk.....	13 00
Wallsend.....	9 00
Scotch Splint.....	8 50
Rymah.....	8 50
West Hartley.....	8 50
	To load.....
	to load.....

Eastern Metal Markets.

By Telegraph.

New York, July 9.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday.....	101 1/2	101 1/2	.....	.....	.....
Friday.....	101 1/2	101 1/2	.....	.....	.....
Saturday.....	101 1/2	101 1/2	.....	.....	.....
Monday.....	101 1/2	101 1/2	.....	.....	.....
Tuesday.....	101 1/2	101 1/2	.....	.....	.....
Wednesday.....	101 1/2	101 1/2	.....	.....	.....

Quicksilver is strong at a slight advance. Borax is firm. Pig tin is firmer under a fair demand. Iron is barely steady. Copper begins to exhibit more strength.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 30, 1891.

- 455,148.—ELEVATOR SAFETY DEVICE—W. N. Anderson, San Rafael, Cal.
 455,151.—SPRINKLER—A. J. Bartlett, Pomona, Cal.
 455,153.—SMOKE CONSUMER—F. L. Bates, Sacramento, Cal.
 454,993.—RECOIL OPERATED MAGAZINE GUN—R. M. Catlin, Tuscarora, Nev.
 455,169.—SAW BIT—HOLDER—S. H. Chase, San Jose, Cal.
 455,172.—SAWING MACHINE—Coffelt & Vierech Jr., Doe Bay, Wash.
 455,178.—PIPE COUPLING—M. J. Dillenburgh, S. F.
 454,940.—SEPARATOR—J. H. Driller, Los Angeles, Cal.
 455,200.—CASTING MACHINE—J. S. Griffin, Roslyn, Wash.
 455,207.—WIND ENGINE—S. Griswold, Davenport, Wash.
 455,255.—EQUALIZING DEVICE FOR WINDMILLS—E. L. Kenoyer, Hanford, Cal.
 455,004.—HAY RAKE—D. F. Oliver, S. F.
 454,889.—VALVE FOR SINKS, ETC.—A. A. & F. B. Stout, Fowler, Cal.
 455,135.—HOT AIR BRIDGE WALL—E. W. Tucker, S. F.
 455,138.—ELECTRIC SIGNAL FOR STEAM VESSELS, D. D. Wass, S. F.

The following brief list, by telegraph, for July 14 will appear more complete upon receipt of mail advices:

California—Solomon D. Brastow, San Francisco, and J. E. Riel, Newcastle, balance scale; Isaac C. Clever, San Francisco, sectional can for stamp mills; Frank A. Fox, San Francisco, car coupling; Frank A. Fox, San Francisco, assignor to C. E. Bishop, Brooklyn, car coupling; Henry S. Grace, assignor to J. A. Niecher, San Francisco, rock drill; Bernhard E. Henriksen, San Francisco, hoe-bridge; Orange M. Loveridge, Weaverville, derrick; Joseph H. Nethercott, San Francisco, brakehead attachment; Orrin M. Parker, Oakland, double-acting left pump; Clarence M. Symonds, San Francisco, can faucet; William A. Woods, Santa Cruz, assignor to Pacific Gold Savings Company of California, gold saver and concentrator; Joseph H. Yenton, assignor of one-half to J. Campbell, Colorado Beach, crushing mill.

Oregon—Edward G. Good and J. Thorne, Portland, assignors of one-third to E. Rast, Saginaw, Mich., ore separator.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SMOKE-CONSUMER.—Frank L. Bates, Sacramento. No. 455,153. Dated June 30, 1891. This invention relates to that class of devices for effecting in furnaces a more perfect combustion whereby the smoke is consumed, in which a plate extending into the fire-box serves to direct the air downwardly and in intimate contact with the fuel. The invention consists in the novel construction and arrangement of the air-shield whereby its adjustments are effected, and the peculiar plate for controlling the draft. The object is to provide an air-shield mounted in such a manner as to be entirely independent of the door and capable of having a vertical adjustment and a forward and back adjustment. Another object is to provide for regulating the incoming draft by reducing its volume at an advanced stage of combustion, when the greater portion of the smoke may have been consumed.

PIPE-COUPLING.—Michel Dillenburgh, S. F. No. 455,178. Dated June 30, 1891. In a former patent issued to the same inventor Aug. 4, 1885, is shown a coupling in which the two meeting ends of the pipes are enclosed by a sleeve, the end of which enters a recess or seat which is made in the head surrounding the pipe. This recess is made somewhat larger than the pipe and straight for a short distance after which it tapers, passing entirely through the head, and a split ring or sleeve is fitted into this taper portion and is compressed upon the pipe by drawing the head up by means of bolts passing through it and another similar head on the other part of the pipe. In the present invention the coupling heads or sleeves have tapering openings of larger diameter than the pipe made only a portion of the way through them from their adjacent faces and the split clamping rings, made correspondingly conical at one end, fit into these tapering spaces, while the opposite ends abut against packing-rings which are fitted within a sleeve intermediate between the coupling-heads or sleeves. By this construction the inventor is able to make the heads of smaller diameter and less bulky and when the bolts are removed, if it is desired to uncouple the pipes, it is easier to loosen and separate them.

SAW-BIT HOLDER.—Stephen H. Chase, San Jose. No. 455,169. Dated June 30, 1891. This holder is semi-circular in shape, and its front or inner curve forms a continuation of the throat of the saw-plate so as to provide a free escape for the saw-dust. The central portion of the holder is made narrow enough so as to have some elasticity so that the ends of the semi-circular press outwardly, and thus serve to hold the bit firmly in place. By extending the lower end of the bit below the concave front or back and forming the sockets for the extension of the bit and holder they are more firmly locked in the plate, prevented from being displaced by sudden strains, and the saw-plates and parts may be made much thinner.

SAW MILL MACHINERY.—J. A. Robb, 117 and 119 Main St., San Francisco, makes a specialty of manufacturing hand and circular saw-mills, bead hocks, boilers and engines, logging cars and locomotives, Robb's patent lathe mills, gang edgers, etc. He also builds and repairs quartz-mill machinery of all kinds. Mr. Robb is well known and does reliable work.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Best & Belcher M. Co., Nevada.....	49..... 50c.....	L. Osborn.....	309 Montgomery St.
Clara Cons. M. Co., S. Dakota.....	4..... 25c.....	A. Cheminant.....	323 Montgomery St.
Cons. Pacific M. Co., California.....	13..... 10c.....	F. E. Lyle.....	310 Pine St.
Evening Star M. Co., California.....	2..... 1c.....	J. S. Scoville.....	320 Sansome St.
Gray Eagle M. Co., California.....	24..... 3c.....	A. W. Barrows.....	303 California St.
Imperial M. Co., Nevada.....	13..... 3c.....	G. W. Luce.....	312 California St.
Mammoth Springs M. Co., California.....	20..... 50c.....	R. P. Mott.....	Forest City
Mineral King M. Co., Arizona.....	8..... 10c.....	T. Norman.....	419 California St.
Navajo M. Co., Nevada.....	21..... 20c.....	W. Pew.....	310 Pine St.
Northwestern L. M. Co., Br. Columbia.....	3..... 8c.....	F. G. Stancina.....	309 Montgomery St.
Peer M. Co., Arizona.....	19..... 10c.....	N. T. Messer.....	309 Montgomery St.
Piedmont M. Co., Nevada.....	2..... 5c.....	J. S. Scoville.....	320 Sansome St.
Saratoga M. Co., Nevada.....	1..... 2c.....	W. & Drake.....	109 California St.
Seg. Belcher & Mides Cons. M. Co., Nev.....	8..... 25c.....	E. H. Holmes.....	309 Montgomery St.
Silver King M. Co., Arizona.....	13..... 20c.....	J. W. Pew.....	310 Pine St.
Telegraph Drift M. Co., California.....	4..... 6c.....	F. R. Weber.....	Downieville
Teresa M. Co., Mexico.....	4..... 10c.....	A. Cheminant.....	323 Montgomery St.
Union Cons. M. Co., Nevada.....	43..... 30c.....	A. W. Barrows.....	303 California St.
Valley View M. Co., California.....	3..... 5c.....	W. J. Garnett.....	308 Pine St.

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Best & Belcher M. Co., Nevada.....	L. Osborn.....	309 Montgomery St.	Annual.....	July 13
Clara Cons. M. Co., S. Dakota.....	A. Cheminant.....	323 Montgomery St.	Annual.....	July 13
Cons. Pacific M. Co., California.....	A. W. Barrows.....	303 California St.	Annual.....	July 30

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M. Co.....	T. Wetzel.....	320 Sansome St.	10.....	June 15
North Banner Cons. M. Co., California.....	T. J. Mitchell.....	Grass Valley.....	50.....	Apr 20
North Commonwealth M. Co., Nevada.....	J. W. Pew.....	310 Pine St.	25.....	June 17
North Star M. Co., California.....	D. A. Jennings.....	401 California St.	50.....	Apr 5
Pacific Coast Borax Co., California.....	A. H. Clough.....	320 Montgomery St.	100.....	July 10

Mining Share Market.

The stock exchanges adjourned from Wednesday, July 1st, to Tuesday morning, July 7th, and of course, the gudeons made money by not being able to gamble at other persons' money making game. Since the Holidays, the prices or quotations for shares have been marked up slightly with Potosi and Bullion the leaders. The advance in these two stocks, is like all Gen. Hayward's surprises—not heralded by cappers whose chief stock in trade is knowing how to keep broke and eking out a precarious living by giving points to gudeons to beat the pool. Those in position to know the inside workings of the market are not overly sanguine in the market making much of an up move in this month, and think the advance in the middle stocks is a flash in the pan to make a few shorts fill. Time alone will tell whether this opinion is correct, but of one thing, the writer is firmly convinced, and that is, the mines were never in better condition for successful exploiting, and also for taking out ore more cheaply and at less risk of fires, water, caves and other unforeseen events. The long drift on the Ophir 1465-foot level and another on the 1600-foot level which extend through, from Con. Virginia into Sierra Nevada, give good circulation on all levels above and afford the best of facilities for opening out the West or Red lode, which is so rich in gold—and this will be done before the close of 1891.

Among mining men it is now asserted that they have at last been able to locate the Baby that Senator Fair is said to have discovered and its location ever since kept a secret. Senator Fair was superintendent of Con. Virginia when he gave currency to the remark that they had "discovered the Baby, and it was larger and richer than the Daddy." The fight going on over the West Con. Virginia ground has uncovered the Baby and makes it morally certain that the bonanza was found in Con. Virginia's west workings. Evidently those who control the latter mine thought Andes owned the ground. This is confirmed by the recorded agreement between these two mines, but after getting possession of the latter mine, and having surveys made, it is said that the pool is convinced that West Con. Virginia's patented ground takes in the bonanza, and the question now is how to get it without paying for it? In looking over Senator Fair's annual reports when superintendent of Con. Virginia, we were surprised to see that the bullion turned out over 81 per cent of its battery assays. With improved methods of milling the per centage now-a-days should be not less than 85 per cent. Whose fault is it that they are so low?

Stockbrokers appear all "broke up" over the decision of the Supreme Court against carrying stock on a margin. That the decision will stand we do not entertain the shadow of a doubt, and we are firmly convinced it will prove the best for the mining industry, for it will bring it down to legitimate business and not stock gambling as it is now conducted. It will unquestionably have a tendency to bring in a better class of buyers, and it will also make the so-called mine managers enter the market and buy stock for election purposes. This will make the market more active. It is singular brokers do not make a change, for almost any kind is better than the present.

There is no denying but many brokers are very uneasy over the Court's decision on dealing in stocks on a margin, and it may result in their compelling customers to take up their accounts. It is quite certain they will not take any new accounts, as the law or constitution is interpreted by the courts, for they have no protection in the event of prices going down, unless they put the purchased stock in their customers' name, and loan money on the security. This makes it a legitimate business transaction, and in making it so, any loss can be collected at law from the borrower. News from the Comstock mines is of a very important character. Our advices indicate that in one or two of the mines, an ore body is being opened up. This will revive the Comstock mining shares along the entire lode. Before the ore is ready to be shown up, it is equally certain that more assessments will be levied to frighten outside holders into selling.

From the outside mines our advices are of an encouraging character, from the Bodie District, Tuscarora District and also Columbus or Candelaria District.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING JUNE 18.	WEEK ENDING JUNE 25.	WEEK ENDING JULY 2.	WEEK ENDING JULY 9.
Alpha.....	75..... 85.....	65..... 85.....	60..... 70.....	70..... 80.....
Alta.....	35..... 75.....	60..... 75.....	65..... 75.....	70..... 80.....
Andes.....	1.40..... 1.90.....	1.65..... 1.95.....	1.15..... 1.10.....	1.10..... 1.15.....
Bodie.....	1.40..... 1.65.....	1.85..... 2.25.....	1.55..... 1.30.....	1.45..... 1.40.....
Belle Isle.....	70..... 80.....	85..... 95.....	80..... 90.....	90..... 100.....
Best & Belcher.....	2.75..... 3.40.....	2.15..... 3.05.....	2.10..... 2.30.....	2.50..... 2.50.....
Bullion.....	2.35..... 2.65.....	2.00..... 2.60.....	2.30..... 2.40.....	3.00..... 3.00.....
Bodie Cons.....	70..... 1.05.....	75..... 90.....	90..... 90.....	90..... 90.....
Bullion.....	35..... 50.....	45..... 55.....	55..... 55.....	55..... 55.....
Commonwealth.....	50..... 70.....	65..... 70.....	65..... 70.....	65..... 70.....
Con. Va. & Oal.....	8.00..... 9.75.....	6.00..... 8.75.....	6.87..... 6.00.....	6.25..... 6.25.....
Challenger.....	1.20..... 1.50.....	1.05..... 1.55.....	1.10..... 1.25.....	1.25..... 1.25.....
Chollar.....	2.30..... 2.60.....	2.00..... 2.60.....	1.80..... 2.10.....	2.10..... 2.10.....
Comstock.....	3.75..... 4.00.....	3.75..... 4.00.....	3.75..... 4.00.....	3.95..... 3.95.....
Con. Imperial.....	15..... 15.....	10..... 15.....	15..... 15.....	15..... 15.....
Caledonia.....	40..... 50.....	45..... 50.....	50..... 50.....	50..... 50.....
Ophir Point.....	1.25..... 1.40.....	1.30..... 1.75.....	1.25..... 1.40.....	1.25..... 1.30.....
Crocker.....	15..... 15.....	10..... 15.....	15..... 15.....	15..... 15.....
Del Monte.....	3.00..... 6.50.....	4.00..... 4.20.....	3.25..... 3.50.....	3.60..... 3.60.....
Eureka Cons.....	50..... 65.....	55..... 60.....	55..... 60.....	60..... 60.....
Exchequer.....	15..... 15.....	10..... 15.....	15..... 15.....	15..... 15.....
Gold & Silver.....	1.50..... 1.75.....	1.80..... 2.15.....	1.75..... 2.10.....	2.10..... 2.10.....
Hale & Norcross.....	1.75..... 2.25.....	1.80..... 2.30.....	1.60..... 1.90.....	2.15..... 2.00.....
Julia.....	15..... 15.....	10..... 15.....	15..... 15.....	15..... 15.....
Justice.....	65..... 70.....	70..... 70.....	70..... 70.....	70..... 70.....
Kentucky.....	30..... 35.....	35..... 35.....	35..... 35.....	35..... 35.....
Lady Wash.....	20..... 25.....	20..... 25.....	20..... 25.....	25..... 25.....
Mono.....	40..... 45.....	45..... 45.....	45..... 45.....	45..... 45.....
Mexican.....	2.30..... 2.80.....	2.05..... 2.60.....	2.20..... 2.15.....	2.25..... 2.25.....
Navajo.....	15..... 15.....	25..... 25.....	25..... 25.....	25..... 25.....
North Bullion.....	50..... 55.....	55..... 55.....	55..... 55.....	55..... 55.....
Nev. Queen.....	20..... 25.....	25..... 30.....	25..... 30.....	30..... 30.....
Occidental.....	85..... 95.....	100..... 125.....	90..... 115.....	115..... 115.....
Ophir.....	3.75..... 4.30.....	3.00..... 4.15.....	3.20..... 3.95.....	3.20..... 3.20.....
Chollar.....	2.00..... 2.20.....	2.50..... 2.60.....	2.20..... 2.10.....	2.20..... 2.20.....
Potosi.....	4.30..... 4.30.....	4.15..... 4.30.....	3.75..... 4.05.....	4.05..... 4.05.....
Peerless.....	10..... 15.....	10..... 15.....	15..... 15.....	15..... 15.....
Peer.....	05..... 05.....	05..... 05.....	05..... 15.....	15..... 15.....
Savage.....	1.60..... 2.00.....	1.50..... 1.90.....	1.45..... 1.70.....	1.70..... 1.70.....
S. E. & O.....	60..... 70.....	75..... 75.....	75..... 75.....	75..... 75.....
Sierra Nevada.....	1.35..... 2.30.....	1.80..... 2.25.....	1.70..... 2.20.....	2.15..... 2.15.....
Silver Hill.....	20..... 25.....	25..... 25.....	25..... 25.....	25..... 25.....
Scorpion.....	1.50..... 2.40.....	1.90..... 2.30.....	2.10..... 2.05.....	2.10..... 2.10.....
Union Cons.....	1.50..... 2.40.....	1.90..... 2.30.....	2.10..... 2.05.....	2.10..... 2.10.....
Utah.....	60..... 80.....	80..... 80.....	80..... 80.....	80..... 80.....
Yellow Jacket.....	1.95..... 2.15.....	1.65..... 2.20.....	1.55..... 1.85.....	1.75..... 1.75.....

Sales at San Francisco Stock Exchange.

THURSDAY, July 9, 9:30 A. M.	
50 Alpha Con.....	75c
225 Belcher.....	1.40
210 Best & Belch.....	2.25
400 Bullion.....	2.70
200 Chollar.....	2.20
510 Oon Cal & V.....	6.50
300 Crown Point.....	1.30
100 Gold & Curry.....	1.40
300 Grand Prize.....	1.50
400 Hale & Nor.....	1.95
200 Justice.....	65c
100 Median.....	1.25
100 Mt Diablo.....	2.25
100 Occidental.....	1.25
540 Ophir.....	3.00
200 Overman.....	2.10
100 Potoc.....	4.60
400 Savage.....	1.65
100 Sierra Nevada.....	2.15
100 Union Oon.....	2.05
200 Uta.....	1.70
100 Yellow.....	1.20

San Francisco Metal Market.

WHOLESALE.		THURSDAY, July 9, 1891.	
ANTIMONY.....	—	16	15
BORAX—Refined, in carload lots.....	8	@	—
Powdered.....	8	@	—
Concentrated.....	74	@	—
All grades jobbing at an advance.			
COPPER—			
Bolt.....	22	@	—
Shenking.....	22	@	—
Sheet, 14 in. long.....	—	@	15
do, wholesale.....	—	@	—
Fire Box Sheets.....	22	@	24
LEAD—Pig.....			
.....	43	@	—
Sheet.....	75	@	—
Pipe.....	74	@	—
Shot, discount 10% on 500 hags Drop, @ hag.....	1 30	@	—
Bullet, @ hag.....	2 00	@	—
Chilled do.....	2 00	@	—
QUICKSILVER—By the flask.....			
Flasks, old.....	41	@	50
.....	40	@	—
CHROME IRON ORE, @ ton.....	10 00	@	—
Iron—Bar, base.....	3	@	31
Norway, base.....	3	@	52
STEEL—English, lb.....			
Canton tool.....	16	@	20
.....	9	@	9
Big Diamond brand.....	9	@	9
Pick and Hammer.....	8	@	10
Machinery.....	4	@	5
Toe Calk.....	—	@	44
TRAVELER.....	6 50	@	—
Charcoal, 14x20.....	6 50	@	—
do roofing, 14x20.....	6 00	@	—
do, do, 20x22.....	13	@	—
Pig tin, spot, @ lb, irregular, @.....	—	@	21
Spot.....			
Iron—Glenagarnock ton.....	30	@	—
.....	28	@	—
England, ton.....	23	@	—
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The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

ARIZONA MINES.		Dr.	Cr.
Crocker.....		\$11,376	\$2,955
Head Center and Tranquility.....			1,180
Locomotive.....			1,940
Pear.....			5,692
Peerless.....			
Silver King.....	3,163		
Weldon.....		355	
BODIE MINES—CALIFORNIA.			
Bodie.....		12,921	
Bulwer.....		3,865	
Mono.....		5,200	
Standard.....		11,222	
Syndicate.....		2,083	
TULARE MINES—NEVADA.			
Belle Isle.....		760	
Commonwealth.....		5,052	
Del Mouto.....		9,969	
Diana.....		405	
Grand Prize.....		5,014	
Independence.....		2,091	
Navajo.....		8,762	
Nevada Queen.....		11,352	
North Belle Isle.....		25,845	
North Commonwealth.....		2,290	
Found Treasure.....		515	
COMSTOCK MINES—NEVADA.			
Alpha Con.....		19,473	
Alta.....		8,904	
Andes.....		24,134	
Belcher.....		4,524	
Best & Belcher.....		11,513	
Bullion.....		9,510	
Benton.....		77,401	
Caledonia.....		14,915	
Challenger Con.....		6,063	
Chollar.....		45,652	
Confidence.....		2,122	
Con. Cal. & Virginia.....		229,145	
Con. Imperial.....		8,181	
Con. New York.....		11,055	
Crown Point.....		18,825	
Excelsior.....		6,319	
East Sierra Nevada.....		2,769	
Ogild & Curry.....		153	
Hale & Norcross.....		11,713	
Julia Con.....		1,120	
Justice.....		10,828	
Kentuck.....		17,622	
Lady Washington.....		6,893	
Mexican.....		5,663	
Occidental.....		13,694	
Ophir.....		5,211	
Overman.....		47,590	
Potosi.....		44,395	
Savage.....		13,624	
Seg. Belcher & Mides.....		0,746	
Scorpion.....		31,063	
Sierra Nevada.....		18,117	
Silver Hill.....		13,227	
Union Con.....		15,058	
Utah.....			
MISCELLANEOUS MINES.			
Euroka Con.....		40,473	
Holmes.....		37,903	
Mount Diablo.....		12,176	

NOTE.—Navajo has \$12,800 due and bullion on June account. North Commonwealth has bullion on June account. Holmes bullion, unsold, 10,221 ounces. Commonwealth has money due, \$3,190.63. Con. Cal. & Virginia has bullion on hand amounting to \$86,293.53; also further shipments to arrive on June account.

MINES and Stock in Mines for sale. See advertisement on page 27.

FRANCIS SMITH & CO., Manufacturers of Sheet Iron and Steel PIPE!

ALL SIZES.
130 Beale Street, San Francisco, Cal.
Iron cut, punched and formed, for making pipe on ground. All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

WANTED IMMEDIATELY.

I HAVE INVENTED AN ARTICLE THAT WILL PALE all other similar classes, and I desire some one with money to assist to secure a place on the market. State plainly the amount to be put into the industry, and the interest required in the business. Will cheerfully give all the information necessary. Address JOHN CAMERON, 759 Tupper St., Santa Rosa, California.

Practical Mining Expert.

HAVING ASSOCIATED MYSELF WITH MINING FOR the last 35 years, including three years through five of the principal mining States of old Mexico, I am now prepared to examine and report on formation, together with the permanency, as well as the character of the vein, whether gold, silver, copper, lead or tin. Address JOHN C. COX, Santa Rosa, Sonoma County, Cal.

RICH * BARGAINS

IRRIGATED LANDS

Can be had by applying to E. M. DEWEY, Porterville, Tulare Co., or A. T. DEWEY, 220 Market St., San Francisco,

— VIZ. : —

Five-Acre Villa Lots within one mile of Tulare City limits, at from \$50 to \$80 per acre. Good investment for small or large holders.

Twenty to 160-acre Lots in N. E. quarter of section 8, township 21, range 24, seven miles S. W. of Tulare City. Fenced and every acre cultivated; adjoining a young and nicely growing orchard and vineyard.

Twenty to 80-acre Lots in N. W. Quarter of section 8, adjoining the above; all fenced, ditched and cultivated; \$25 per acre. The quarter (160 acres) will be sold as a whole, with a splendid flowing artesian well, large reservoirs, 7 acres of 8-year-old orchard; 20 acres of alfalfa, and 7-room, 2-story, hard finished house, in good order, costing, with barn and the other improvements mentioned, over \$5000; will be sold at \$40 per acre. The house, front yard and reservoir are environed with beautiful shade trees and shrubbery.

N. E. Quarter of section 7, adjoining, in 20-acre lots, all rich and well cultivated; in 20-acre lots, \$30 per acre; as a whole, \$27.50 per acre.

Plentiful ditch irrigation is to be had for every acre of this land at very reasonable rates. All except the first quarter mentioned is near the center line of the celebrated Tulare artesian belt of flowing wells.

The N. E. one-quarter and south one-half of Sec. 15, T. 23, R. 24, three miles S. W. of Pixlev, Tulare Co., in 40-acre lots, \$20 per acre; 160 acres or more, \$18 per acre; entire, \$16 per acre. Also in Artesian Belt.

The above valuable but extremely low-priced lands will be sold on small cash payments and long-term credit or installments at 8 per cent interest, if bargained for soon.

Visitors to the premises will do well to notify the above-named owners a little in advance. They invite close examination and cash offers. These terms will probably prevail for a short time only.

MINING —AND— Ore Dressing Machinery.

By C. G. WAMFORD LOOK.

CONTENTS.—Motive Power—Transmission of Power. Crushing—Prospecting, Shaft-sinking, Coal-cutting, Pumping, and Ventilating Machinery—Lighting—Hauling and Hoisting Transport—Reducing—Dressing—Miscellaneous.

Prices \$21.00. Circulars and Catalogues on application. E. & F. N. SPON, Publishers, 12 Cortlandt St., New York.

G. H. EVANS & CO.

(Successors to THOMSON & EVANS, 110 and 112 Beale Street, S. F.)

MACHINE WORKS,
Steam Pumps, Steam Engines
and all kinds of MACHINERY.



Declaration of Levy Brown on Spiritualism.

SPANISH CAMP, June 16, 1891.
Mr. Brown came to my place in 1887 and brought with him two men who desired to examine two quartz ledges, which they wished to prospect and, if satisfactory, to purchase the same. One of them liked the ledge on the east side of Big Canyon and was anxious to buy, but said his money was East. He wrote for the money, but failed to get it until his bond expired. After they left I felt fatigued, and laid down to rest and fell asleep. Woke up soon. When I got on my feet I heard the noise of a quartz mill. The stamps struck one, two, three. After that there was a general roar from the stamps. Ran one or two minutes and then struck three, two, one. In about two minutes I heard three distinct whistles from an engine. I wish to sell this ledge and all the land east of the canyon, about 15 or 18 acres. I also wish to sell my ranch west of canyon containing about 140 acres, about 9000 bearing vines and 50 fruit trees of different varieties; also berries of different kinds. House, out-building, with cellar well filled with wine, with all implements necessary to care for the vine. Terms, half cash, the balance on time, with seven per cent interest per annum.

His Mark.
Subscribed and sworn to before me this 16th day of June, 1891. JOHN McCARTY, Notary Public.

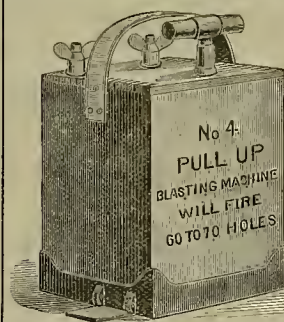
ATTENTION.

NOTICE IS HEREBY GIVEN THAT ANY PARTIES infringing patents granted me by the United States on Air Compressors and Rock Drills, by manufacturing, using or selling the same, will be prosecuted to the full extent of the law.

CHAS. CUMMINGS, 411 Mission St., San Francisco.

BLOWING ENGINE FOR SALE.

Vertical pattern, with balanced steam slide valve gear, steam cylinder 14 in. diameter, air cylinder 40 in. diameter, stroke 24 in. 1 to 100 strokes per minute; engine new. For price and particulars address JAMES LEFFEL & CO., Springfield, Ohio.



Send for Catalogue.

PARKE & LACY CO., San Francisco, Cal., AGENTS

ELECTRIC BLASTING.

VICTOR ELECTRIC PLATINUM FUSES. Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in neat paper boxes of 50 each. All tested and warranted. Single and double strength, with any length of wire.
VICTOR BLASTING MACHINE.—Made in two sizes. No 2 fires 20 to 30 holes. No 1 fires 5 to 8 holes. Adapted for prospecting, stump blasting, quarry and general railroad work.
"PULL UP" BLASTING MACHINE.—The strongest and most powerful machine ever made for Electric Blasting. No 4 size fires 70 holes. No 3 size fires 40 holes. Are especially adapted for submarine blasting and large mining work.
Standard Electric Fuse and Blast Tester. Wire Reels, new design, Leading and Connecting Wire.

MANUFACTURED ONLY BY JAMES MACBETH & COMPANY, 125 Maiden Lane, New York City.

Adamantine Shoes and Dies

—AND—
CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

THESE CASTINGS ARE EXTENSIVELY USED IN ALL THE MINING STATES and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS, Agent, 220 Fremont St., San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MESE,

Sole Licensed Manufacturers of the

MEDART PATENT WROUGHT RIM PULLEY

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington, Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

SHAFTING, HANGERS AND APPURTENANCES.

SEND FOR CIRCULARS AND PRICE LIST.

NOB. 129 and 131 FREMONT STREET, SAN FRANCISCO, CAL.

DEWEY & CO.

AMERICAN AND FOREIGN PATENT SOLICITORS

ESTABLISHED 1860.

OFFICE OF THE "Mining and Scientific Press" Pacific Rural Press

No 220 Market St.

TAKE ELEVATOR No 12 FRONT ST.

SAN FRANCISCO, CAL.

LONG DISTANCE ELECTRIC POWER TRANSMISSION. WATER POWER

Made Available over Circuit Many Miles Long for Running TRAMWAYS, HOISTS, DRILLS, STAMPS, PUMPS, LIGHT, &c.

FOR PARTICULARS AND ESTIMATES, CALL ON OR ADDRESS

THOMSON-HOUSTON ELECTRIC CO.,
15 FIRST STREET, SAN FRANCISCO.

WILLIS G. DODD, Vice-President and Manager.

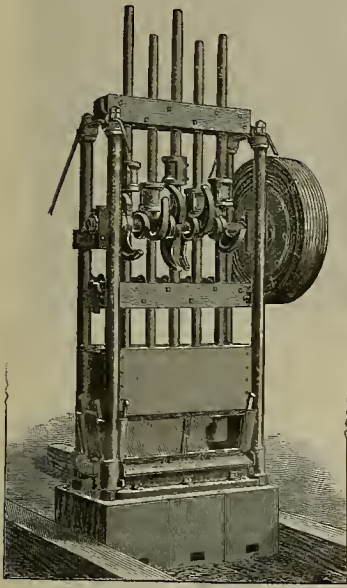
IRA P. RANKIN, President.

PACIFIC IRON WORKS,

ESTABLISHED 1850.

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MINING MACHINERY, ENGINES AND BOILERS.



MACHINERY FOR REDUCTION OF GOLD,
SILVER, LEAD AND COPPER ORES

— BY THE —

Milling, Smelting or Concentration Process,
Of Most Improved Design and Construction

SPECIALTIES:

WHEELOCK'S AUTOMATIC CUT-OFF
ENGINE.
HAZELTON STEAM BOILERS.
IRON-FRAME STAMP BATTERIES.
ORE CRUSHERS. CORNISH ROLLS.
ROASTING AND CHLORIDIZING
FURNACES.
WATER-JACKET SMELTING FURNACES
FOR COPPER AND LEAD ORES.
DUNCAN CONCENTRATORS.
BAKER'S HORSE-POWER HOISTS.
WATER WHEELS.

SEND FOR CIRCULARS.

LEVIATHAN COTTON BELTING.

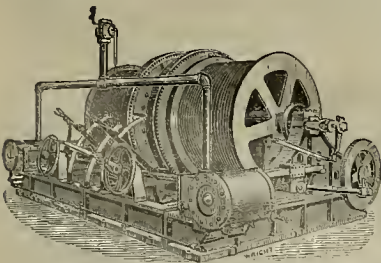
Superior to all Others for Quartz Mills, Smelters, &c.

Not Affected by Wet, Steam, Heat or Oils. Every Belt Guaranteed. Try It. Send
for Circular and Samples.

NEVILLE & CO.,

27 TO 33 CALIFORNIA STREET, - - - SAN FRANCISCO, CAL.

HOISTING ENGINES FOR MINES



1, 2, or 4 Drums, with Reversible Link
Motion or Pat. Improved Friction.

MADE ONLY BY THE

LIDGERWOOD M'F'G CO.,

96 Liberty St., New York.
84 and 86 West Monroe St., Chicago.
197 to 203 Congress St., Boston.
1 to 7 N. First St., Portland, Oregon.

PARKE & LACY CO., Agts., San Francisco.
Send for Catalogue.



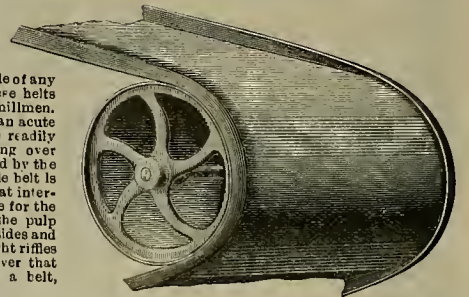
SQUARE FLAX PACKING.

MANUFACTURED FROM STRICTLY FIRST-CLASS FLAX AND PURE LUBRICANTS. HAS NO SUPERIOR
for all Hydraulic Work.
W. T. Y. SCHENCK—Dear Sir: We find your "Red-Cord" Square Flax Packing the "Best." Yours truly,
J. R. LANE, Secretary.
The red cord runs the entire length. Put up in boxes of 20 feet, or coils of 60 to 80 lbs. For sale by all
dealers W. T. Y. SCHENCK. Sole Manufacturer, 222 and 224 Market Street, San Francisco, Cal.

DEWEY & CO., { 220 MARKET ST., S. F. } PATENT AGENTS.
Elevator, 12 Front.

THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have
our new Concentrating Belt manufactured in
San Francisco; we can therefore fill all orders
on short notice. The length and width of these
belts are the same as is used on the Frue or
Triumph Concentrating Machines, but can be made of any
length or width desired. The advantages of these belts
over any others will be readily seen by practical millmen.
First, the flanges or edges of our belt stand at an acute
angle inclining toward the center, and therefore readily
conform to the change of direction while passing over
the end rollers; thus the vexation and loss caused by the
frequent breaking of the flanges of the old style belt is
practically done away with. Again, our belts, at intervals
of four feet, have a very slight rifled surface for the
space of three inches, which tends to equalize the pulp
on the belt, and prevents it from banking on the sides and
forming channels through the center. These slight rifles
also save very fine sulphurets and the quicksilver that
would otherwise escape with the tailings from a belt,
the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

RAND DRILL COMPANY,

ROCK DRILLING, AIR COMPRESSING,
MINING AND QUARRYING

MACHINERY,



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PLACER AMALGAMATORS

Combined with Steam Shovel or Dredge.

BUCYRUS SYSTEM.

NEW METHOD OF PLACER MINING.

Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.

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Pacific Chemical Works.

HENRY G. HANKS,

Practical and Industrial Chemist, Assayer
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Will report on the condition and value of any mining property on
the Pacific Coast. Rare Chemicals made to order. Instructions given in
Assaying and Practical Chemistry.



IT HAS NO EQUAL.

POSITIVELY FIRE-PROOF.

Can Be Put On
by Any One.



Adopted by the
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MAGNESIA SECTIONAL COVERING

For BOILERS, STEAM PIPES, COLD STORAGE, and all places requiring
Non-Heat-Conducting Material.

N. E. CORNER
PAOIFIO & DAVIS STS. — C. B. JOHNSON & CO. — SAN FRANCISCO.

FRUE ORE CONCENTRATOR

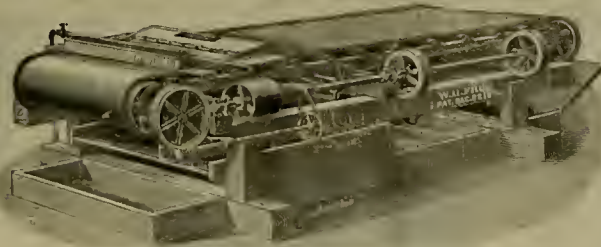
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



PROTECTED BY PATENTS—September 2, 1879;
April 27, 1880; March 22, 1881; February 20,
1883; September 18, 1883; July 24, 1888.
Patents applied for.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

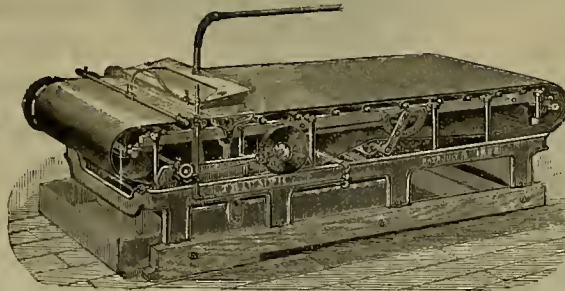
"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.

Price "Triumph" Concentrators, with Plain Belt - - - - - \$550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 461 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.
Grass Valley, Nevada Co., Cal., Nov. 10, 1886.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

(Signed) DAVID McKAY, Jr.,
Supt North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

PARKE & LACY COMPANY

— IMPORTERS AND MANUFACTURERS OF —

MINING, MILL and GENERAL MACHINERY.

ENGINES, BOILERS, STEAM PUMPS,

AIR COMPRESSORS, ROCK DRILLS,

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CONCENTRATORS, PULVERIZERS,

TURBINE WATER WHEELS,

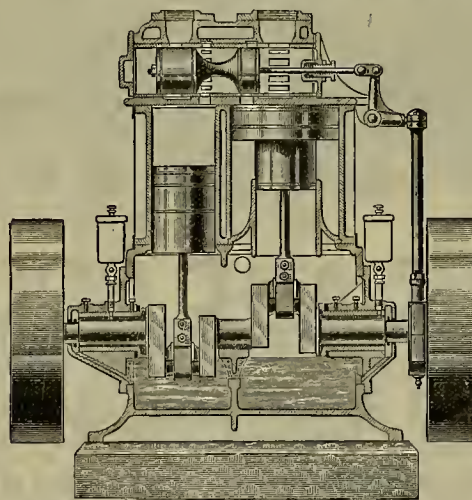
ROCK BREAKERS, DRY JIGS.

Bullock's Diamond Drills

GOLDEN GATE CONCENTRATORS,

GREATEST CAPACITY OF ANY CONCENTRATOR MADE,

One Machine Taking Pulp from 10 Stamps.



SAW MILLS, MACHINE TOOLS,

PLANING MILLS, INJECTORS and EJECTORS

BELTING, PACKING, OILS, LUBRICATORS,

FIRE EXTINGUISHERS,

CENTRIFUGAL PUMPS

ROTARY PUMPS, GANG EDGERS,

CAMPBELL'S STEAM FEEDS,

MILL and MINE SUPPLIES.

WESTINGHOUSE AUTOMATIC ENGINES.

COMPOUND, 44 ENGINES,
5215 HORSE POWER.

SALES DURING LAST FOUR MONTHS:
STANDARD, 99 ENGINES,
4500 HORSE POWER.

JUNIOR, 166 ENGINES,
4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 18,975 Horse Power.
21 and 23 Fremont St., San Francisco, Cal.

189 Clarence St., Sydney, N. S. W.

F. A. HUNTINGTON.

— MANUFACTURER OF —

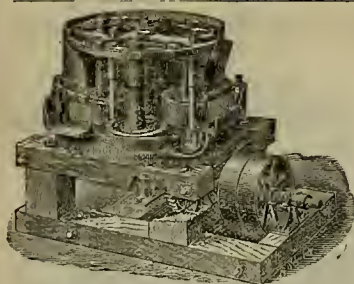
CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description.

Steam Engines and Shingle Machines.

SEND FOR CIRCULAR.



Centrifugal Roller Quartz Mill.

213 FIRST STREET.

SAN FRANCISCO, CAL.

TUBBS CORDAGE CO.
(A Corporation.)

Constantly on hand a full assortment of Manila Rope, Duplex Rope, Tanned Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

611 & 613 Front St., San Francisco, Cal.

A. T. DEWEY
W. B. EWER.
GEO. H. STRONG.

Dewey & Co.'s Scientific Press Patent Agency { ESTABLISHED 1860

INVENTORS on the Pacific Coast will find it greatly to their advantage to consult this old, experienced, first-class Agency. We have able and trustworthy Associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 230 Market St., S. F.

W. H. CONLY,
Mining Commission.

REAL ESTATE INVESTMENTS A SPECIALTY; 124 Sansome Street, Room 4, San Francisco; Telephone No. 5057.

JOSHUA HENDY MACHINE WORKS,

(INCORPORATED SEPTEMBER 29, 1882.)

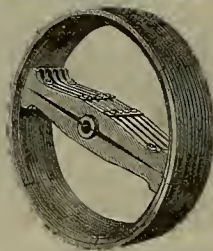
NOS. 39 TO 51 FREMONT STREET, SAN FRANCISCO, CALIFORNIA.

Manufacturers of NEW and Dealers in SECOND-HAND

BOILERS, ENGINES, PUMPS AND MACHINERY OF EVERY VARIETY.

AGENTS FOR THE SALE OF

"ECLIPSE CORLISS" ENGINES.
 "RUSSELL" AUTOMATIC ENGINES.
 "CLIMAX" BAND-SAW MILLS.
 "ECONOMIZER" BOILERS AND ENGINES.
 "ERIE ENGINE WORKS" BOILERS AND ENGINES.
 GARLOCK'S ELASTIC SPIRAL PACKING.
 "REEVE'S" WOOD SPLIT PULLEYS.
 ROTARY AND CENTRIFUGAL PUMPS.
 BUFFALO DUPLEX STEAM PUMPS.
 "SENSIBLE" HORSE-POWER WHIMS.
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 MACHINISTS' TOOLS OF ALL STYLES FOR ALL WORK.



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 QUARTZ MILLING MACHINERY.
 SAW MILLING MACHINERY.
 HYDRAULIC GRAVEL ELEVATORS.
 HYDRAULIC GIANTS AND GATES.
 "TRIUMPH" ORE CONCENTRATORS.
 AUTOMATIC ORE FEEDERS.
 MINE AND MILL SUPPLIES.
 LEATHER AND RUBBER BELTING.
 LUBRICATING COMPOUNDS.
 WATER PIPE, ETC., ETC.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 1300 IN USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

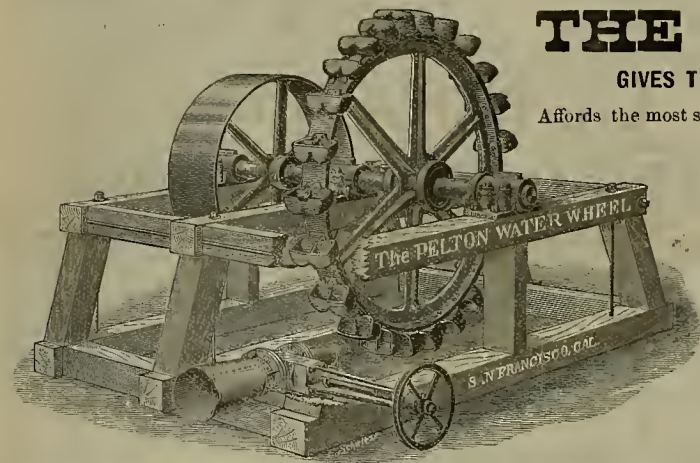
ELECTRIC TRANSMISSION.

The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

All applications should state amount and head of water, power required and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

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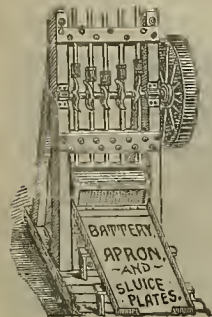
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, JULY 18, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

The Marsh Steam Pump.

In the Marsh steam pump, now being introduced on this coast by the Riedon Iron Works of this city, the most important and usually complex part—the steam valve—has been simplified to one part without auxiliary appendages, accomplishing, however, what other valves of multiple parts do and possessing the function of regulation to a remarkable extent. All the working parts of the pump are so perfectly enclosed that only a small part of the piston rod is exposed to view. This steam pump is designed to fill a noticeable want of engine-builders and steam users for a reliable, economical and efficient boiler feeder. In the Marsh steam pump is offered the advantages possessed by the injector and usual type of pumps combined, with some additional advantages not possessed by either. It is neat and compact in form and ornamental to an engine. It can be set to supply any amount within its capacity. The number of strokes per minute is not materially varied by the rise and fall of steam pressure, and the pump is not injured by rapid reciprocations when the water supply gives out, as the valve mechanism is within itself an automatic governor. In point of economy it cannot be excelled by any boiler feeder, as it returns to the boiler all the steam it uses.

The advantage of an independent and self-contained steam pump over the usual type of attached or cross-head pumps, consists principally in its ability to supply water when the motive-power is at rest, and the facilities which it affords the operator to nicely grade the requisite amount of feed-water regardless of the motion of the engine. Heater pipes and cross-head pumps are inseparable companions, and although the heater is regarded by builders as a nuisance, the use of attached pumps requires their employment. This new pump, however, enables the engine builder to dispense with the heater, as it warms its own water, but does not heat it enough to precipitate foreign substances. An exhaust deflecting valve is used to deflect the exhaust steam

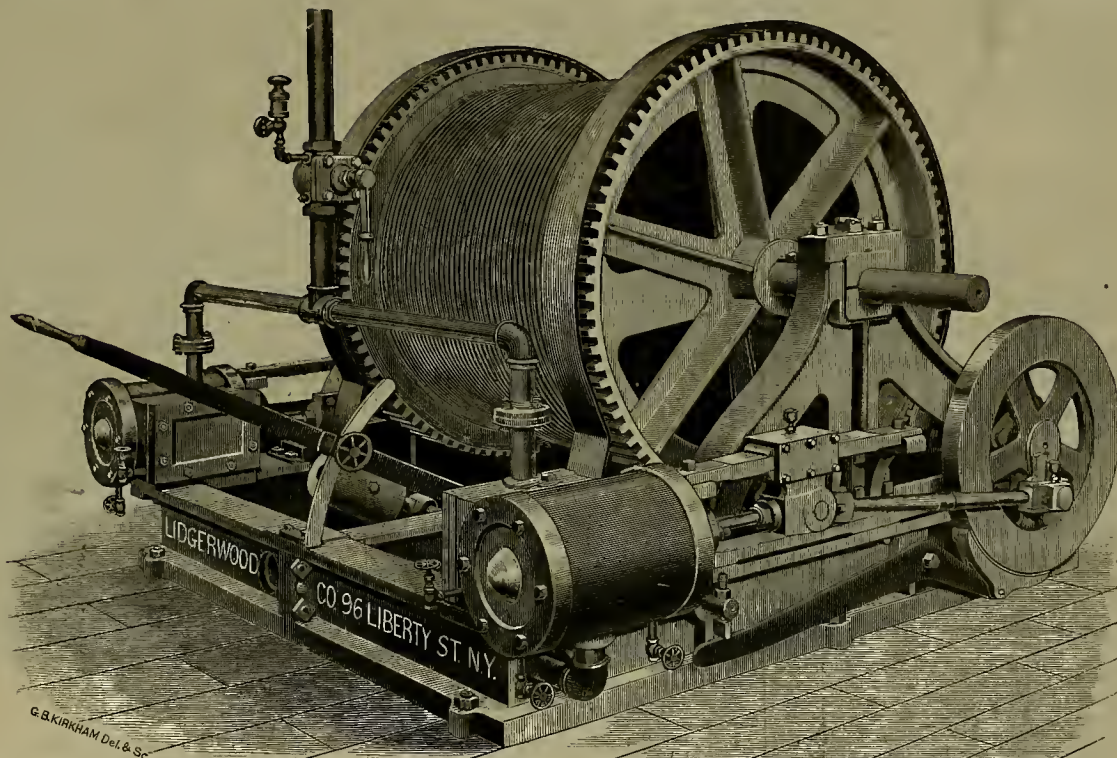
either into the atmosphere or into the suction chamber. When deflected into the suction chamber it is condensed by the cold water and mingles with and warms it, and is then pumped into the boiler.

The sectional view of the pump shows the steam valve in position, the steam and water pistons, manner of packing, etc. The steam valve is made of brass, and though nicely fitted, moves freely in the central bore of the steam

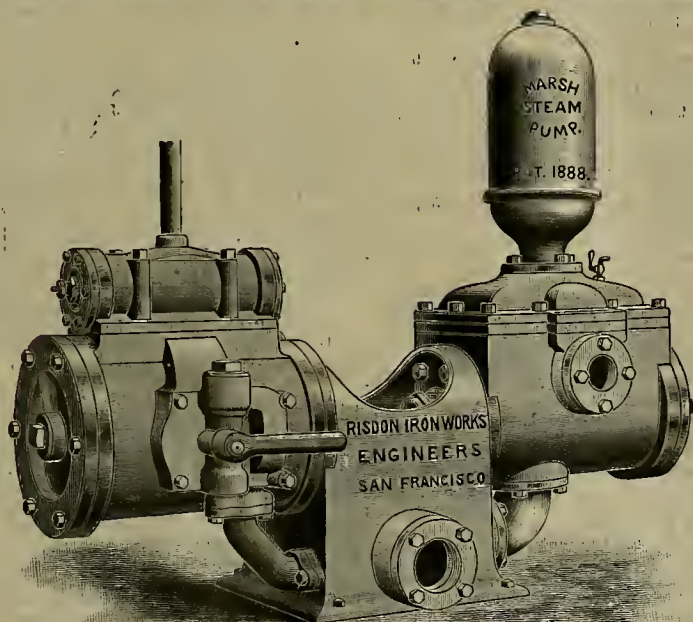
chest. It has no mechanical connections with other moving parts of the pump, but is actuated to admit, cut off and release the steam by live steam currents which alternate with the reciprocations of the steam piston. Each end of the valve is made to fit the enlarged bore of the steam chest, and it is due to these enlarged valve heads, which present differential areas to the action of steam, and the perfect freedom of the valve to move without hindrance from other mechanical arrangements or parts, that the flow of steam into the pump is automatically regulated. The importance of this feature cannot be overestimated, as the pump is automatically regulated, and can never run too fast to take suction, or should the water supply give out when the throttle valve is wide open, no injury can occur to the moving parts. The steam valve does not require setting. It

has no dead center, and will always start when the steam is admitted. The steam piston, as shown, is double, and each head is provided with a metal packing ring, the interior space constituting a reservoir for live steam pressure, supplied by the live-steam pipe through a drilled hole, shown by dotted lines. At each end of the steam cylinder are similar holes leading to each end of steam chest, which, together with the centrally drilled hole, and the space between the piston heads, constitute positive means for tripping or reversing the valve with live steam.

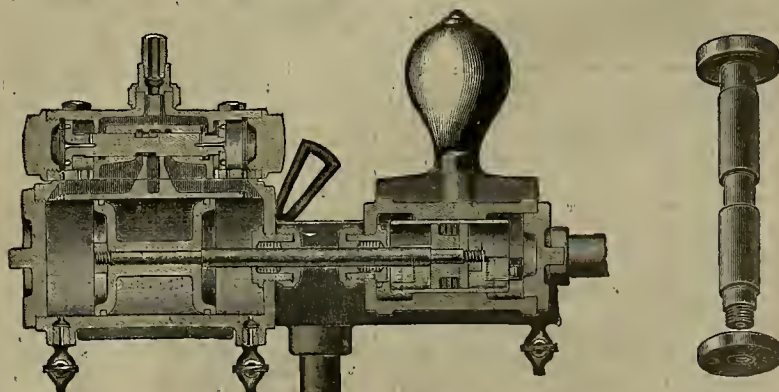
THE break in the Colorado river, which lets the water into the Colorado desert forming a lake at Salton, is said to be a mile wide, and the water is probably 12 feet deep where it flows out.



DOUBLE CYLINDER REVERSIBLE LINK MOTION HOISTING ENGINE.—See page 40.



THE MARSH STEAM PUMP.



STEAM VALVE, PISTONS, STUFFING-BOXES AND STEAM PARTS OF MARSH PUMP.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

New Discoveries in Montana.

Glendale.

EDITORS PRESS:—We learn occasionally of some new prospect that promises to eclipse anything heretofore known. The latest, and one that is creating considerable excitement, is on Red mountain, on the head of Camp creek, Silver Bow county, 12 miles from Melrose and about 15 miles southerly from Batte. The discoverers, John Ogren, an old prospector and resident of Glendale, and Joseph Durrer of Heola, made the first location in the latter part of May last, named the American Mint. Since then they have made three locations on the extension of the ledge. The Morning Star on the north and the Mountain Lion and Mountain Sheep on the south. From Ogren we learn that the American Mint is over 200 feet wide, several holes having been sunk in the solid formation, and only one wall discovered. It is his opinion that the whole vein-matter will run from 20 to 50 ounces silver, but several assays have exceeded 100 ounces, and one event 364 ounces silver. Old prospectors state that they have run over the ledge dozens of times, but the vein-matter being so much different in appearance from anything they were acquainted with, they did not consider it worth assaying.

Now, however, there is quite a stampede to the locality, and Mr. Reynolds, superintendent of the Anaconda Co.'s mines on Camp creek, having learned of the wonderful discovery, and looked over the ground, put several men to work prospecting in the vicinity next morning after his first observations. It is reported that he has discovered a fine-looking ledge.

Messrs. Hutchins & Sirla of this place have located a four-foot ledge joining and parallel to the American Mint, the ore of which is similar in character. Many more locations have been made, of which we have no definite information.

Ogren & Durrer have now got men at work making a road to the claim, and will commence shipping ore as soon as possible. It is said to be the milling rock, and the owners have located a mill-site and water right within a few hundred yards of the ledge; but, being poor men, they will be obliged to ship their ore until means are acquired to put up works of their own.

Making due allowance for excitement, the opinion prevails here that the boys have a good thing, and the stir created by this strike will doubtless result in many valuable new discoveries.

Melrose will be benefited more than any other town by a boom on Camp creek, and should do all that is reasonable to encourage prospecting in that locality. It is one of the most beautifully situated towns in Montana, at the mouth of the Big Hole canyon, on the U. & N. R. R., where Moose creek and Camp creek waters could be utilized for milling or smelting purposes to good advantage.

From Vipond district, near Glendale, we learn that the new mill of 15-stamp capacity is now completed and will start up for its first run on Gray Jocky ore. The new shaft on that mine is now down 40 feet, all in ore, and immense bodies are stripped on the surface, with about 100 tons on the dump—in fact everything about the place looks encouraging, and the company are to be congratulated on the result of their labors. H. W. B.

THE ALTA TANKS.—The Alta tanks were started yesterday to help drain the Gold Hill mine. Their capacity is 700 gallons each—two of them working on counter balance. Record was kept of their work for the first two hours of starting. They raised 216 tanks in two hours, being at the rate of 1,800,000 gallons in 24 hours, or nearly double what has been undertaken to be done. While this was done with men who didn't have the complete "hang" and "run" of things, better results are not looked for—everything being absolutely satisfactory. The Gold Hill Pumping Association is to be thanked. It has been owed by nothing. It has been met with formidable obstacles everywhere every hour of its existence. Undismayed it has done its best. The men composing the association have gone down in their pockets every month. They have called into requisition every resource in their power; they do not give up; they persist. The developing and working of ore bodies below the water level will be entirely due to them. They should ever be remembered as pioneers in the good work, and benefactors of the community.—*Virginia Enterprise.*

PIERCE WINS HIS SUIT.—James P. Pierce has won the suit instituted against him by the Excelsior Water and Mining Company. Pierce was a director in the company, and during his term of office, the corporation paid 18 dividends, aggregating \$266,000. The company sued Pierce for the amount, claiming that the dividends, declared with the concurrence of Pierce, were not paid out of the surplus profits of the business, and were by the laws of the State illegal. Pierce won his suit in the lower court, and the company appealed. Last week the Supreme Court gave judgment against the corporation.

Local Industries.

Statistics of Mechanics and Manufactures.

Assessor Siebe has filed a statistical report of the mechanical and manufacturing industries of San Francisco, which, from a commercial standpoint, is quite important.

It shows the total number of hands employed, to be 39,765, and the value of all products \$104,745,650. This is a marked increase over the figures shown by the census of 1880, which placed the total number of hands employed at 28,442, and the value of the products at \$77,824,299. The increase in hands employed is 11,323, and in the value of products \$26,921,351. The figures in detail given by the assessor, are as follows:

Agricultural implement manufactories, 4; men employed, 100; value of manufactures, \$175,000.

Artificial stone manufactories, 21; men employed, 250; value of manufactures, \$1,000,000. Axle grease manufactories, 5; men and boys employed, 40; resin consumed annually, 2900 barrels; fat consumed annually, 52,000 pounds; chemicals consumed annually, 60,000 pounds; value of manufactures, \$90,000.

Bag manufactories, 4; men and boys employed, 160; bags manufactured annually, 12,700,000; value of manufactures, \$535,000.

Barrel manufactories, 24; men and boys employed, 575; barrels, half-barrels and kegs made annually, 1,360,000; horse-power of engines, 100; barrels made for sugar refineres, 650,000; syrup kegs made by tub and pall factories, 65,000; value of manufactures, \$1,150,000.

Bed-spring manufactories, 1; men and boys employed, 35; copper wire used, 450 tons; value of manufactures, —.

Bedding and upholstering factories, 18; men and boys employed, 300; value of manufactures, \$800,000.

Bellows manufactories, 3; men and boys employed, 8; bellows manufactured, 210; value of manufactures, \$9000.

Belting manufactories, 5; men employed, 80; value of manufactures, \$250,000.

Billiard table manufactories, 4; men and boys employed, 80; billiard tables made annually, 525; value of manufactures, \$60,000.

Boots, shoes and slipper manufactories, 162; men, women and boys employed, whites, 1400, Chinese, 900; value of manufactures, \$4,510,000.

Box manufactories (oiger), 4; men, women and boys employed, 350; number of boxes made annually, 2,220,000; value of manufactures, \$265,000.

Box manufactories (paper), 7; men, women and boys employed, 130; value of manufactures, \$140,000.

Box manufactories (wooden), 8; men, women and boys employed, 430; horse power of engines, 700; lumber used annually, 3,200,000 feet; value of manufactures, \$1,015,000.

Brass foundries, 7; men and boys employed, 280; value of manufactures, \$445,000.

Breweries, 21; men employed, 550; hops consumed, 1,150,000 pounds; barley consumed, 60,000 tons; beer manufactured, 660,156 barrels; value of manufactures, \$3,995,000.

Broom manufactories, 12; men and boys employed, 180; value of manufactures, \$250,000.

Brush manufactories, 12; men and boys employed, 125; value of manufactures, \$110,000.

Candle manufactories, 4; men and boys employed, 140; candles manufactured, 130,000 boxes; value of manufactures, \$250,000.

Cer manufactory, 1; men employed, 95; oars built, 137; value, \$140,000.

Carriage and locomotive car spring factory, 1; men and boys employed, 11; springs made, 120 tons; value, \$30,000.

Carriage and wagon manufactories, 50; men and boys employed, 500; carriages and wagons made, 1950; value, \$1,000,000.

Chemical works, 7; men and boys employed, 40; nitrates of soda consumed, 360 tons; sulphur consumed, 1350 tons; nitric acid produced 260 pounds; value of manufactures, \$175,000.

Cigar manufactories, 348; men, women and boys employed, 670, Chinese, 3000; cigars manufactured, 110,804,940; cigarettes, 40,840,860; tobacco manufactured into cigars and cigarettes, 2,350,000 pounds; value, \$3,700,000.

Clothing manufactories, —; men, women and boys employed, 2800; value of manufactures, \$6,500,000.

Coffee, spice and yeast powder factories, 11; men and boys employed, 146; coffee ground and roasted, 8,450,000 pounds; chocolate made, 500,000 pounds; spices and yeast powder made, 1,200,000 pounds; value of manufactures, \$2,000,000.

Coffin manufactories, 2; men and boys employed, 35; value of manufactures, \$110,000.

Coppersmiths, 6; men employed, 25; value of manufactures, \$100,000.

Cordage and rope factory, 1; men and boys employed, 220; hemp rope manufactured, 3700 tons; horse power of engines, 260; value of manufactures, \$675,000.

Cracker manufactories, 3; men and boys employed, 275; horse power of engines, 100; value of manufactures, \$1,100,000.

Cream tartar works, 1; men employed, 55; cream tartar made, 400 tons; value, \$115,000.

Cutlery manufactories, 10; men employed, 85; value of product, \$100,000.

Dry docks, floating, 2; men employed, 50; capacity—first, 4400 tons; second, 2000 tons—6400.

Dry docks, stone, 1; length of excavation, 490 feet; width on top, 120 feet; width on entrance, 90 feet; depth, 30 feet; capacity of length, 425 feet; capacity of drawing, 22 feet; capacity of pumps for cleaning per hour, 325; 368 cubic feet; tubular boilers of four-inch tubes, 4; dimension each tube, inches in diameter, 25; fire surface, 38,000 square feet; men employed, 10; cost of work, \$675,000.

Electric machinery works, 16; men employed, 140; value of manufactures, \$150,000.

Elevator manufactories, 7; men employed, 60; elevators made, 80; value, \$100,000.

Flour and feed mills, 15; men and boys employed, 275; flour made, 250,000 barrels; hominy made, 300 tons; buckwheat end rye flour, 600 tons; oatmeal and groats, 2800 tons; cornmeal and farine, 1500 tons; feed barley, 24,000 tons; cracked wheat, 750 tons; split peas, 250 tons; graham flour, 5500 barrels; cracked corn, 2000 tons; ground feed, 9000 tons; pearl barley, 300 tons; value, \$3,500,000.

Foundries, machine shops, boiler and iron works, 43; men and boys employed, 4500; pig iron consumed, 14,000 tons; bar iron consumed, 33,000 tons; rivets consumed, 2500 tons; horse power of engines, 3000; value of product, \$6,000,000.

Fridge factories, 8; men and women employed, 200; value of manufactures, \$450,000.

Fruit-preserving factories, 6; men and boys employed, 800; fruit and meats put up, 4,960,000 dozen cans; value of manufactures, \$2,980,000.

Fur manufactories, 6; men and women employed, 200; value of manufactures, \$350,000.

Furniture manufactories, 21; men and boys employed, 959; lumber used annually, 9,400,000 feet; value of manufactures, \$1,530,000.

Fire works, 1; men and boys employed, 15; value of manufacture, \$40,000.

Gas works, 2; men employed, 620; value of manufactures, \$12,000,000.

Glass staining, cutting and bending works, 3; men and boys employed, 80; value of product, \$915,000.

Glass works, 2; men and boys employed, 170; furnaces, 2; pots, 9; value of manufactures, \$370,000.

Glove manufactories, 18; men and boys employed, 550; value of manufactures, \$900,000.

Glue manufactories, 3; men and boys employed, 25; glue made annually, 475 tons; neatfoot oil made annually, 24,000 gallons; value of manufactures, \$50,000.

Glycerine manufactories, 1; men employed, 15; horse power of engine, 60; crude material used, 100,000 pounds; value of glycerine refined, \$115,000.

Gutta-percha and rubber factories, 2; men employed, 12; sets of machinery, 2; value of manufactures, \$25,000.

Hat and cap manufactories, 10; men and women employed, 185; value of manufactures, \$55,000.

Harness manufactories, 52; men and women employed, 600; value of manufactures, \$1,275,000.

Ice manufactories, 3; men employed, 30; tons made annually, 4800; value of manufactures, \$25,000; capital invested, \$40,000.

Ink and mucilage factory, 1; men employed, 16; value of product, \$37,000.

Japanning and galvanizing factories, 4; men and boys employed, 30; value of manufactures, \$210,000.

Jewelry manufactories, 14; men employed, 135; value of manufactures, \$940,000.

Laundries (white), 44; men, women and boys employed, 1500.

Laundries (Chinese), 284; employees, 1704.

Last manufactories, 2; men employed, 22; lasts made annually, 22,000; value of product, \$22,000.

Lead pipe and shot factory, 1; men employed, 60; lead pipe and shot made annually, 3000 tons; horse power of engines, 100; value of product, \$375,000.

Lined oil works, 2; men employed 62; oil cake made annually, 4550 tons; product of works, 1,250,000 gallons; value of oil, \$800,000; value of cake, \$95,000.

Macaroni and vermicelli factories, 9; men and boys employed, 75; macaroni and paste made annually, 155,000 boxes; flour used annually, 9000 barrels; value of product, \$130,000.

Malthouses, 5; men employed, 80; grain malted annually, 27,500 tons; value of manufacture, \$1,650,000.

Marble works, 33; men employed, 150; value of product, \$300,000.

Match factories, 4; men and boys employed, 145; matches made annually, 2,500,000 packages; value of manufacture, \$64,000.

Mirror manufactories, 3; men employed, 44; number of square feet made annually, 100,000; value of product, \$200,000.

Musical instrument manufactories, 19; men and boys employed, 105; number of pianos and organs made annually, 565; value of manufactures, \$163,950.

Nutmeg manufactories, 1; men employed, 5; boxes made annually, 9,500; value of product, \$38,000.

Oilcloth manufactories, 1; men and boys employed, 22; value of product, \$20,500.

Onyx manufactories, 1; men employed, 5; value of manufactures, \$12,200.

Potteries, 2; men employed, 35; value of manufactures, \$140,000.

Provision packing factories, 5; men employed, 240; beef packed, 8000 barrels; pork, 5500 barrels; ham and bacon, 1,100,000 pounds; lard, 1,200,000 pounds; tallow, 2,250,000 pounds; value of product, \$1,100,000.

Rolling mills, 1; men employed, 900; horse power of engines, 1500; scrap iron used, 24,705 tons; coal consumed, 26,015 tons; value of product, \$1,400,000.

Rubber stamp manufactories, 11; men employed, 60; value of product, \$64,000.

Safe and vault works, 3; bar and iron plate used, 45 tons; steel used, 75 tons; value of manufactures, \$152,000; employees, 26.

Saw manufactories, 3; men employed, 100; horse power of engines, 50; steel used, 500 tons; value of manufactures, \$140,000.

Shirt manufactories, 35; men and women employed, 2100; value of manufactures, \$750,000.

Shipyards, 6; men and boys employed, 650; number of steamers, barges and other vessels built, 33; tonnage, 21,000; value of craft built, \$3,575,000.

Silverware manufactories, 6; men employed, 75; value of manufactures, \$620,000.

Soap factories, 29; men employed, 150; soap made, 12,000,000 pounds; value, \$2,600,000.

Salt works, 5; men employed, 55; run of stones, 9; number of tons, 24,000; value, \$175,000.

Sash, door, blind and finishing factories, 12; men and boys employed, 1450; horse power of engines, 900; lumber consumed, 12,500,000 feet; value, \$5,000,000.

Soda water works, 16; men employed, 140; value of manufactures, \$135,000.

Solder and habit works, 3; men employed, 30; value of manufactures, \$115,000.

Sugar refineries, 2; men employed, 1000; sugar, raw, used, 240,000,000 pounds; sugar, white, made, 134,000,000 pounds; sugar, yellow, made, 72,000,000 pounds; syrup made, 260,000 gallons; value, \$12,250,000.

Tanneries, 43; men employed, 850; horse-power of engines, 1600; bark used, 18,000 cords; hides of all kinds used, 1,750,000; value of manufactures, \$2,750,000.

Tanneries and wool pulling, 4; men employed, 180; horse power of engines, 200; bark used, 500 cords; sheepskins used, 460,000; goat-skins used, 25,000; oilskins used, 30,000; wool produced, 610,000 pounds; value of raw material, \$230,000; value of manufactures, \$445,000.

Tinware, tin box and can factories, 7; men and boys employed, 2100; value of manufactures, \$4,540,000.

Trunk and valise manufactories, 5; men employed, 200; value of product, \$255,000.

Type foundries, 1; men employed, 135; value of manufactures, \$46,000.

Vinegar and pickle factories, 6; men employed, 150; vinegar made, 970,000 gallons; pickles preserved, 120,000 gallons; value, \$200,000.

White lead manufactory, 1; men employed, 60; number of tons made, 3400; value, \$265,000.

Windmill manufactories, 4; men employed, 65; number of mills and oaks made, 1200; value, \$75,000.

Wire and wire rope manufactory, 1; men employed, 250; horse power of engines, 535; wire consumed annually, 17,000; value of manufactures, \$930,000.

Wool scouring and grading mills, 5; men employed, 125; wool scoured, 12,000,000 pounds; value of product, \$2,750,000.

Woolen mills, 1; men employed, 240; number of power looms, 36; cards, 8 sets; spindle, 8000; blankets made, 11,700 pairs; wool used, clean, 375,000 pounds; cloth, tweed and flannel, made, 31,000 yards; value, \$362,000.

Sea and Railway Travel.

In long-distance travel, the sea "still has the edge," notwithstanding the greatly increasing railroad mileage of the world. A friend of ours, Mr. C. H. New of New York, recently completed his second voyage around the world, and during his stay in San Francisco, where he was detained by illness, he told us of the miles he had traveled between 1880 and 1891. On his first voyage in 1880, he was gone eight months, spending some time in the East Indies. In his second voyage, recently completed, he was gone 115 days, starting January 10th. He also spent three months in South America and the West Indies a few years ago. In these trips, he traveled a total of 102,250 miles, of which 11,050 were by rail and 91,200 miles by sea. On the last voyage he visited England, France, Switzerland, Italy, Sicily, Egypt, Arabia, India, Ceylon, Australia, New Zealand, Tonga Islands, Samoan Islands and Sandwich Islands, landing in his native country in California. From here he went through Nevada, Utah, Colorado, Nebraska, Iowa, Illinois, Indiana and Pennsylvania to New York.

During all these thousands of miles of travel only one accident of note was met with, and that was shipwreck near Melbourne.

One could scarcely suppose, unless attention was called to it, that a large proportion of the travel around the world would be by sea. In these days of high speed and fine steamers, with every comfort and appliance, sea travel has lost its unpleasant features. Schedule time is closely carried out by the sea steamers between all the principal ports of the world.

MONTGOMERY.—M. T. Plamenaz of Candalaria, tells in the *Chloride Belt* that he believes a flourishing city will soon grow up at Montgomery, Nev. Montgomery, the discoverer, is employing 35 men, at \$4 wages. A 20-stamp quartz mill is to be put up this fall.

The Great Douglas Spruce.

Chief of trees in point of numbers, and one of the largest composing the great forest development of the Northwest, is the Douglas Spruce, (*pseudotsuga taxifolia*—Sargent).

It is almost everywhere a component of this great forest in all its vast extent, from the shores of the Pacific to the slopes of the Rocky Mountains, and from British Columbia to central Mexico. The headquarters of this development—generated by the warm Japan current—is an elongated, moist region bordering the Puget sound and extending southwest to Cape Mendocino.

In the larger part of this belt the Douglas Spruce forms almost exclusive bodies of dense forest, the tall, straight, self-trimmed trees making depths of excessive seclusion and gloom.

Accessible only from the ocean through the few arms of Puget sound, with the Columbia and half a dozen other navigable rivers south of it, the Douglas Spruce was the first lumber tree to be reached and utilized—and so great has been the consumption, and so inexhaustible the supply, that no lumber is more familiar to dealers than this found in our markets under the names of "Oregon Pine," "Yellow Fir," "Red Fir," "Douglas Spruce," etc., the last being the only appropriate name.

When standing alone or on the edge of a forest it becomes a beautiful, symmetrical cone of verdure, the lower limbs sweeping the ground and all of them in the season, bearing their small, feathered cones pendant from the ends of the branchlets, on all sides—in the manner of all the rest of the spruce trees—but in the dense forest it trims itself and becomes tall, straight and slender.

The bark of the Douglas Spruce is variable, usually dark and very thick, often light colored and only a few inches thick.

The wood is also variable. Two principal kinds are distinguishable, designated by the prevailing color: one being yellowish and close grained, the other reddish and coarser grained.

Experienced lumbermen say they can distinguish the "Yellow Douglas" from the "Red" by the general appearance of the standing trees, but others declare that only the ax and saw will reveal these characters. The latter fact suggests that the phenomena is one of conditions rather than inheritance.

The Douglas spruce is used for a great variety of purposes and in vast quantities. For spars and ship timber, it has scarcely a superior anywhere. Square sticks 80 to 100 feet long may be seen any day, passing on rollers out of the many factories on the Puget Sound directly aboard vessels bound to foreign ports. Piles, bridge timber, mining timber, railway ties, flooring, weather-boarding, stair lumber—almost every conceivable use is made of this truly beneficent tree.

No tree of the Northwest is wider or more thoroughly distributed than this. It is as though the Japan *Ku-ro Si-ua* and the trade wind had especially created this tree to clothe the drenched shores and mountain tops of the West, while the pines, firs, redwoods, etc., are but incidentals, chance products of little moment, and perhaps of transient duration.

The Douglas spruce, but slightly changed in appearance or qualities, is found abundantly in British Columbia and on all the cross ranges reaching to the western slopes of the Rocky mountains, and on nearly all the ranges paralleling the coast far into Mexico, the only considerable region omitted being the interior basin between the Sierra Nevada and the Wasatch mountains. What is also remarkable is the apparent equal vigor and enormous dimensions this tree attains whether near the sea-level in the coast mountains or on the Cordilleras, at elevations of 10,000 feet.

In favorable localities, it becomes 200 to 300 feet high and four to seven, often 8 to 12 in diameter.

Near a famous lumber camp, in the vicinity of the sound, I secured a photograph of a monster upturned tree, caught midway between two of its fellows, and affording a lofty platform for the operations of the lumbermen, looking like pigmies among these mighty monarchs. (See illustration.)

A tree near Webber lake, Sierra county, Cal., at an elevation of 7620 feet, was 240 feet high, 9½ in diameter and 560 years old.

Wherever any other trees are found flourishing best, no matter of what species, there the Douglas spruce is at its best also, as witness its enormous development in the noted groves of big trees in the Sierra, where it

AN UPTURNED TREE OF DOUGLAS SPRUCE—*Pseudotsuga taxifolia*.

vise with them and the sugar pine in size. No other tree seems to have such pliability of constitution, such powers to overcome environment, any soil and condition, any exposure almost, is welcome to this cosmopolitan tree, and this rare quality of adaptability to varied conditions has been wisely utilized by cultivators far and near, especially those interested in reforesting denuded regions of Europe.

Large quantities of seed are collected annually and sent abroad, and the nurseries of many provinces devote their greatest care to the production of seedlings, while large areas of forest preserves have already been planted to Douglas Spruce.

Principal of the Old-World countries intent upon enriching themselves by utilizing our spruce is Germany, and especially the Kingdom of Prussia. Second only to the Germans are the French, Belgians, Austrians, Swiss, Italians and English, while great quantities of seed are exported to our antipodes of Australia and New Zealand.

The Douglas Spruce has been most unfortunate in its botanical names, having borne a half-dozen different ones since its discovery by Capt. Vancouver in 1797. The subject of the determination of the right name for this tree is discussed in the lately issued third biennial report of the State Board of Forestry, commencing at page 133, to which interested readers are referred.—*J. G. Lemmon in Rural Press.*

The Lumber Trade.

In the year ending May 31, 1890, nearly 144,000 persons were employed in the lumber industry in Michigan, Wisconsin and Minnesota, receiving over \$30,000,000 in wages. The investigations of the Census Bureau indicate that the industry in these States will cease within six years, so far as it depends on lands held by individuals. Already employers have begun to prepare for the future by buying large areas of timbered land in other States. In Montana and Idaho they have become owners of over a million acres of fir and cedar, which it is estimated will yield five thousand million feet, board measure, of merchantable lumber.

In California, Oregon and Washington they have acquired over 1,200,000 acres of fir and redwood, and the estimated yield is nearly

28,000,000 feet. In Virginia, North Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas and Missouri, their holdings amount to 1,400,000 acres of yellow pine and cypress, which, it is estimated, will yield a total of over 11,000,000 feet, and in West Virginia, Kentucky, Tennessee, Ohio and Illinois they own 138,000 acres of yellow poplar and hard woods, which, it is estimated, will produce a total of over 1,100,000,000 feet.

These figures seem prodigious, and yet they make an aggregate of less than 45,000,000,000 feet, which is less than five times the aggregate output of white pine lumber from the mills of the Northwestern States in the year 1890, and less by 18,000,000,000 feet than the estimated amount of merchantable lumber lending on private or corporate holding in the States of Michigan, Wisconsin and Minnesota. On May 31, 1890, the Census Bureau had been unable to ascertain how much land still in these States belongs to the United States and how much to each of the States respectively.

DETERMINATION OF MINERALS.—The J. B. Lippincott Co. have just published tables for the determination of minerals by physical properties, ascertainable with the aid of a few field instruments, based on the system of Prof. Albin Weisbach, by Persifer Frazer. This is the third edition of this handy little book. The new edition of Professor Frazer's useful work marks many important advances in the knowledge of minerals, and its author notes, with proper pride, that the principle for which he contended in the first edition (1874), of the unity of the mineral manacle, in opposition to the theory of Professor J. D. Dana, "has been tacitly conceded by all modern writers, including Professor Dana himself." Professor Frazer has omitted altogether the supplementary tables to assist in the determination of those minerals of non-metallic lustre and colorless streak which cannot be determined by the aid of simple instruments and a close observation of their physical characters, and placed the most important prognostic characteristics and physical and chemical tests of each mineral in the column of "Remarks." The synonyms of minerals have been more largely given than in the previous work, and in some cases, such as garnet, sub-varieties have been added after the synonyms without much notice of the distinction between the two. It is a work which no mineralogist can afford to ignore. The book is sold in this city by Joseph A. Hofmann, 120 Sutter St.

Arizona Onyx.

The Phoenix (A. T.) Herald says: George B. McCann, the well known Yavapai county mining operator, who spent \$150,000 on some of that district's attractive quartz ledge, and who now represents the Los Angeles capitalist, Aaron Mason, former owner of the great Silver King treasure vaults, is just back from an inspection visit to the onyx claims of Holmes & Woodson on Cave creek, about 18 miles north of Phoenix.

These partners have a horizontal deposit from 12 to 20 feet, thick with a known length of 1200 feet, and extending into the hill an unknown distance.

The green variety of onyx largely predominates, although other colors can be obtained in large quantities. With respect to quality Messrs. Holmes & Woodson's deposit ranks with the fine grade of the Mexican onyx, against which it is protected by a duty of 60 cents per cubic foot, or \$6 per ton. The deposit has doubtless been produced by mineral springs which still exist higher up the hill.

Mr. McCann is a large owner in the Big Bag onyx beds, where ex-Adjutant General O'Neill has interested influential eastern and foreign capitalists. The former is frank enough to admit that these Cave creek quarries compare very favorably with his and General O'Neill's claims.

Within a week six or more men will be employed to open up the Cave creek beds. The present Cave creek road must be extended five miles to establish wagon communication with Phoenix. One alleged "expert" said that it would cost \$50,000 but Mr. McCann drove a pair of mules and a buckboard over the ground in its present state and brought back 500 pounds of the stone. Thus the expense of a road cannot be great and the county will be asked to assume it, so, when the quarries are rightly opened from two to five carloads will be shipped from Phoenix daily. This will require from 8 to 20 teams to move it, and double that number must be on the road constantly. Such a traffic will certainly justify the

cost of road extension five miles.

An advance of \$2 per cubic foot over Mexican onyx has been offered for this Cave Creek article, or about \$14 per foot for the green variety sorted out from other layers. A 3100-pound sample lot was shipped to Los Angeles last week, of which one-half went to San Francisco.

In Los Angeles, owners of fine houses are taking down their \$200 marble mantels and putting up Arizona onyx substitutes that cost from \$500 to \$600. The stone is only one point harder than marble and about 12½ per cent heavier, but it takes a higher polish and is not stained by ink or acids, as in Tennessee marble, the finest grade of that stone found in this country. Onyx blocks weighing ten tons can be readily mined in Arizona, and such an advantage in large architectural designs is readily appreciated by builders.

This Cave Creek onyx weighs about 200 pounds to the cubic foot. It can be quarried in the same way that marble is, and Mr. McCann will put such a plant on Holmes & Woodson's grounds immediately. The 500-pound specimen brought in by him this week has been sent to Yuma prison for polishing, and arrangements are being planned whereby the prison labor there may be utilized in working this valuable stone on a large scale.

If onyx should replace marble, as now seems not improbable, Arizona, by proper management, will undoubtedly secure the lion's share of so profitable an industry.

NEW ELECTRIC STATION.—The Edison General Electric Company will soon have a plant established in this city. On the 1st inst. the Edison Light and Power Company was incorporated with a capital stock of \$3,000,000, and on the day following the entire plant, franchises and other property of the California Electric Light Co., used in the central station for lighting this city, was transferred to the new corporation. The consideration for the transfer was \$1,000,000 worth of capital stock in the new company. Geo. H. Roe of the California Co. says the new company will at once begin the construction of a large central station, and will expend \$500,000 within the next six months. The wires will all be placed underground. The arc-light machinery will be transferred from the Jessie street station to the Townsend street station, and the former place is to be used exclusively for supplying Edison incandescent lights.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador Ledger, July 11: Our mines are all doing well, with brighter prospects ahead. At the Hector, operations are progressing in a business-like way. The work of timbering the shaft has commenced. Material for the hoist is coming in, and the erection of the same will be started in a few days. The 40 stamps are kept running on surface dirt, which is said to pay expenses. Winter supplies are coming in at the Wildman—timbers, lagging, etc. The 30 stamps are kept in motion, and everything is looking prosperous.

Calaveras.

ANGELS.—Cor. Mt. Echo, July 10: While in French Corral, North San Juan, and many such places, you see only vestiges of mining and civilization; here you find not a "has been," but a real and energetic town. Scarcely have the mining interests opened yet, and as to development it is a thing of the future. There is but one company that has fairly sunk a shaft below the grass roots, and they have gone down but 600 feet. The Utica mine owned by Charles Lane, Alvinia Hayward and W. S. Hohart, has quartz to keep the mill crushing for seven years, without going down another inch. The pay-roll amounts to from \$10,000 to \$12,000 a month, and they are endeavoring to increase their business. They must find some gold, or they could not pay expenses.

El Dorado.

DARLING.—Georgetown Gazette, July 10: Lively times at the Darling mine. Some 15 men are now employed in the work of putting up the hoisting works for sinking the shaft and developing the mine in a thorough and systematic way. The management mean business and every move so far shows that they understand their business. Most of the men employed are residents of the locality, and such is the confidence in the mine and its successful operation that a feeling of permanency and security has already spread new life in that neighborhood. This week two loads of heavy machinery arrived at the mine, besides large quantities of lumber continue to arrive. Development work now going ahead on the Martin & Ambrose mine continues encouraging. W. S. Lyle, who has the mine bonded, was up from San Francisco this week accompanied by Wm. Pickett. After a thorough inspection and being well pleased with the development made by the present 50-foot tunnel run on the lode, it was decided to run another tunnel on the lode down on the hillside at a point giving 100 feet more depth, or about 240 feet of depth from the surface. Work of sinking the shaft on the Ben Franklin mine is progressing.

Inyo.

DARWIN MINES.—Index, July 8: Mr. J. A. McKenzie was in town yesterday and from him we learn that mining prospects in and about Darwin are better at the present than for some time past. Early developments are looked forward to with confidence.

MINING STRIKE.—James McDonald writes from Darwin to Sheriff Gorman that Frank Snrba and son have made a splendid strike there. At a depth of 140 feet they struck three feet of the finest kind of carbonate ore. Assays show 70 per cent of lead and 100 ounces of silver. This is said to be the best strike of lead ore seen in Darwin for a long time.

MODOC MINES.—Independent, July 10: The June output of ore from the Modoc mines amounted to \$604.47. A full force of men will be worked all summer in the main tunnel. Two shifts of men are now at work at the 300-foot point in ten inches of ore that goes 235 ounces silver per ton. Surface work will be discontinued until Sept. 1st, because of the scarcity of water. The property never looked better than at present.

PINE MOUNTAIN.—It is learned that Andrew Fife has bonded for \$7000 or \$7500 the Roberts mines at Pine mountain. S. P. Roberts, the late owner reserving the Baltic from the transfer. Roberts deserves to make something, as he has hampered away steadily there for the past 12 years. It is to be hoped the investment will prove a more paying one than the former smelting venture in the same region. A four-stamp battery was hauled up this week from Saline valley to the group of mines, and will be put up. The intention is to concentrate the ore and work it on a different system from that formerly employed.

Nevada.

ST. JOHNS MINE.—Grass Valley Union, July 12: Some ore showing very rich in free gold is being taken from the St. Johns mine. The ledge and rock is steadily improving. They are now taking out a few tons for a crushing as a test of the ore.

A NEW MINING ENTERPRISE.—Transcript, July 10: It is stated that arrangements have been made whereby a San Francisco Co., will this season put up milling machinery on the quartz ledges owned by Dr. Holdsworth and son. These claims are situated near Jackson Lake 12 miles in a northerly direction from Graniteville and on this side of the line separating Nevada and Sierra counties. The claims embrace a number of mammoth ledges which the Holdsworths have been prospecting for many years past by sinking and running tunnels. Milling tests of the ore have been made at various times with very encouraging results. The machinery to be erected will be taken to the mines by the way of Emigrant Gap, which is the most accessible railroad point.

THE GERMAN MINE.—Nevada Transcript, July 8: M. D. Cooley, superintendent of the German mine, which is situated on the south side of South Yuba river, in Mayhert district, was in town last night on his way back to the mine from San Francisco. Mr. Cooley is pushing ahead work in a quiet but very energetic manner. The lower tunnel, which will give 253 feet of backs, is now in 350 feet and should soon reach the large and promising ledge which was found in the upper tunnel. The pitch of the ledge is vertical. The lower tunnel has been run much of the distance through the hardest kind of rock, costing as much as \$20 a foot. If the results of the next few weeks' work are as satisfactory as the management has every reason to anticipate, machinery will be erected and the German will become

one of the big mines of Washington township. A first-class company has it in hand.

Placer.

SULPHURETS.—Placer Herald, July 11: A carload of ore containing sulphurets, from A. O. Bell's mine on Bald Hill was shipped up to Grass Valley last Wednesday by C. S. W. Smith. A small amount sent up to be worked not long ago went \$100 to the ton and the shippers think it will pay to ship all the mine products in the future.

Plumas.

DEVELOPMENT WORK.—Cor. Plumas National, July 11: A great deal of development work is now being done in this district. The mines here are attracting wide-spread attention. The indisputable evidence that great mines exist here is proven by the immense amount of gold that has been taken from the surface. A careful estimate based on data at hand, shows the enormous sum that has been gleaned from the surface alone, since the district was formed, to be \$25,000,000, and though this sum is immense, yet I firmly believe that it represents only a fraction of what still remains and is yet undiscovered. The great sources of this surface yield, lie locked within the walls of the great ledges that abound, and the gravel channels that are yet unopened. This field of undeveloped mines offers greater inducements to prospectors than any other within the whole mining belt of the State, but money is the all-important requirement. The surface mines are practically exhausted. The under surface mines must be opened and it is necessary to have capital with which to do it. When capitalists once realize the assurance that rich and permanent mines are here, they will not be slow in coming to the rescue. Peter Hansen is making interesting developments on his quartz mine on Big Creek; this mine joins the famous Edman mine and the developments spoken of bid fair to lead to something that will rival in richness its near neighbor the "Diadem." In the far known as Chicken Flat much gold was found in early days below the ledge. Strange to say, this part of the ledge had never been prospected. Mr. Hanson this spring ran a cut across the flat on the ledge and is now finding quartz of wonderful richness, one piece weighing six ounces and a half, containing five ounces of gold, while some of the gold is almost in a pure state, being free from quartz. A chimney of vast richness will surely be the result of Mr. Hanson's development. The Butte bar ledge is being vigorously prospected; a full crew of men is employed, night and day shifts being run. The quartz is said to be very rich.

LA PORTE.—Cor. Oroville Mercury, July 10: La Porte is on the eve of a mining boom. On entering the bank and store of Dixon Braban, we found Messrs. Thomas and McClelland washing an amount of gold taken from their mine several miles from La Porte, and they had about \$3000 in beautiful coarse gold taken from a bed of gravel, and it was taken by drifting through a flush flume. From that same mine over \$10,000 have been taken this summer, at an expense of \$1200. There are dozens of other mines in the community that are producing equally rich, and old La Porte is bound to boom as a mining center. In proof of this, it is only necessary to state, that during the past few years, Mr. Thomas has patented about eight miles square of gravel bed between La Porte and Gibsonville, and to-day there are two very wealthy companies developing the properties. One of the largest of these is the Thistle Shaft, a Scotch Co., superintended by C. B. Wingate, one of the most intelligent, as well as practical and industrious, miners in California. This company has possession of a large area of gravel bed, and is now, with three shifts of men, sinking a shaft and tunneling into the mountain. They have taken out gravel that pays immensely per car, but have not yet reached the main channel. Mr. Wingate is delighted with the outlook. He is working the latest improved machinery, and his mine will no doubt prove a bonanza. The above-named mine is an extension, or a part of the Bald Mountain Consolidated Gold Mountain Co., which was organized by Mr. Thomas and sold to English and Scotch capitalists. The Bald Mountain mine, superintended by Mr. Thomas, is giving promise of rich returns. Many smaller mines in the district are paying handsomely. We have no hesitancy in saying that next summer La Porte will experience a livelier season than she has in years. At Gibsonville we were also gratified to find the miners hopeful for the future. J. C. Walters ships several hundred dollars' worth of gold dust per month, purchased from small miners, and this fact shows that there is yet much gold hidden in the hills thereabouts.

Sierra.

FOREST CITY.—Nevada Transcript, July 11: The Bald Mountain Extension are putting on men as fast as room can be had for them. They now have a force of 30 and the number will soon be doubled. The gravel looks fine and pays well. John Schneider has struck it rich in the Lucky Boy claim, about one mile from Forest City. The Maple Grove tunnel is progressing rapidly. They are about to put on more men and push the work through as rapidly as possible with the expectation of having the mine on a paying basis by October. This mine will undoubtedly prove to be a genuine bonanza for the stockholders.

Siskiyou.

BLUE GRAVEL.—Cor. Yreka Journal, July 8: The developments so far made in the Yreka B. G. M. Co.'s shaft, which is now 35 feet deep, have demonstrated to the public that the originators of the enterprise knew what they were about. They spent several months in investigating and examining every feature of the business, obtaining in that time the opinions of many practical expert miners and scientific men, and finally satisfied themselves beyond a doubt that there is an immense channel of an ancient river running through the county from north to south or south to north, the direction in which the river ran being still a matter of uncertainty. They assured the people that they could sink a shaft and strike a bed of blue gravel, and that they could strike it in the first attempt. They have only been disappointed in one particular, and that is in striking the bed of blue gravel sooner than they anticipated. It was reached at a depth of 22 feet, the last formation lying over it being a strata of slate five feet thick. The shaft is now 15 feet in blue gravel cement, very hard and difficult to work. While the company were absolutely certain of striking this bed of blue gravel, of course they were not certain that it would pay, as all blue gravel is not

rich. So far, however, it has been proven that it carries gold, as a prospect can be obtained in any portion of it, not enough, however, to pay for working. At Cottonwood the blue gravel bed varies from 40 to 100 feet in depth, only the lower portion being rich, the upper part prospecting about the same as ours. From surface indications and the best calculations that can be made, taking the distance from the shaft to where the rock crops out between the shaft and the bed of Yreka creek, and granting that the bedrock has the same pitch to the east that the sandstone, slate and gravel formations have in the shaft, it is estimated that bedrock will be reached in about 50 feet more. This would make the gravel bed 45 feet deep, the extent to the east, of course, being an unknown quantity. At same point between the channel and Yreka creek the bed pitches both ways, that is, east and west, and the directors of the company believe that they know about where that point is. The benefit that the county, and more especially Yreka, will derive from the development of rich diggings in this channel cannot be estimated.

ORO FINO.—Siskiyou Telegram, July 11: Wm. Lewis of Oro Fino informed the Telegram that the mining outlook in Oro Fino was never better than at present. The Johnson mine, now owned and managed by R. H. Campbell promises next season to pay exceedingly rich, as the surface ground has been or will all he removed this season leaving only the rich bottom to be worked next year. The Allen Bros. mine was never better than at present, and 50 tons of quartz crushed averaged \$40 per ton.

GOLD.—Supervisor Jackson has shown us specimens of gold taken from his mine on Little Humboldt, which, without a doubt, are the richest we ever saw. The gold is taken from a quartz crevice in the bed of the creek, and is almost all solid gold containing but a small amount of quartz. Mr. Jackson informs us that he has over a quart of just such specimens as those shown us, and, in fact he has just as good a thing as he wants.

Trinity.

NEW RIVER.—Trinity Journal, July 11: A letter from New River, received too late for consideration last week, brings the information that the mill on the Ridgeway mine will be started up about the 15th of this month and that the ledge was looking very well.

NEVADA

Washos District.

MIDDLE MINES.—Virginia Enterprise, July 9: The Middle mines are now attracting attention. Interesting conditions are reported from Kentucky, Savage, Hale & Norcross and Bullion. One hundred and sixty feet north of the south line of Savage, on the 1100 level, a very promising body of ore is being developed. On the 1500 level of Hale & Norcross, to the south, the outlook is encouraging. In the south drift from the 1300 level of the Potosi incline winze station, which has been run into Bullion ground, crosscutting will soon be started, from which important results are looked for by local operators. An 18-inch streak of from \$13 to \$27 ore is reported as having been cut on the 1000 level of Kentucky.

ALTA.—Have started the tanks to help drain the water in the Gold Hill mines. Everything works well.

YELLOW JACKET.—Shipping 35 tons daily of silver-bearing rock, worth about \$22 a ton. Are not shipping gold-bearing rock at present, but waiting to ascertain the result of the last run made at the Santiago mill.

CHALLENGE.—The raise from the north drift from the 1100 level is up 55 feet, having been advanced 30 feet. The top shows porphyry.

CONFIDENCE-CHALLENGE.—The north drift on the 200-foot level is in 775 feet, six feet having been made during the week; face shows quartz of no value. Joint west crosscut on 300 level is out 120 feet; seven feet made during the week; face in quartz of no value. Joint north drift on the 680 level is in 667 feet from the Yellow Jacket shaft, 37 feet having been made during the week; face in porphyry. Joint east crosscut on 1000 level is out 47 feet; 12 feet made during week.

JUSTICE.—The north drift on the 822 level was advanced to face since last report, and is now out 757 feet; the face is in low-grade ore. Shipped 116 tons of ore to the mill worth \$17.06 a ton as per battery samples.

KENTUCK.—The north drift from the 1000 level, east raise, is out 23 feet—advanced six feet during the week; face in low-grade quartz. The west crosscut from the top of the north raise, 1000 level, is out 12 feet, and has cut a streak of ore 18 inches in width assaying from \$13 to \$27 a ton, and on which a raise was started July 7th. Have started a west crosscut from the 950 level raise at a point 25 feet above the track floor; it is in six feet and the face is in low-grade quartz.

CON. IMPERIAL.—West crosscut No. 1 from the main north drift on the 300 level is out 35 feet; face in quartz of no value. East crosscut from the 500 level has been stopped for the present.

SEG. BELCHER.—West crosscut from south lateral drift on 600 level has been advanced 12 feet, and is now out 188 feet; face in a mixture of clay, porphyry and streaks of quartz, with a little water running from it.

BELCHER.—The raise from the south lateral drift from No. 2 crosscut, 200 level has been advanced 33 feet during the week; the total height is now 128 feet; the top is in quartz showing occasional spots of pay. The north drift from the main west crosscut from the shaft, 300 level, has been stopped, and a west crosscut started from 100 feet in; it is out 29 feet in a mixture of low-grade quartz and porphyry. The 1300 level east crosscut has been advanced 20 feet since last report, and has reached what looks like the hanging wall.

CROWN POINT.—The south lateral drift from the 300 level south winze is out a total distance of 48 feet; the face is in very heavy ground, composed almost entirely of clay. The 500 level west crosscut has been advanced 20 feet since last report, and is now out 216 feet; the face is in porphyry and low-grade quartz. The east crosscut from the south lateral drift on the 1000 level has been advanced 16 feet, making its total length 221 feet; face in a mixture of porphyry and clay.

SAVAGE.—Milled 400 tons of ore worth \$17.65 a ton, as per battery samples. The "E" shaft tunnel is now repaired 800 feet. The west drift from the new station, Potosi tunnel level, was advanced

19 feet; total, 196 feet from shaft. On the 950 level we have extended a drift west from the top of the upraise 25 feet; expect to connect this drift the coming week with the bottom of winze from 800 level, and then commence the extraction of ore from this portion of the mine. On the 1100 level the north drift from the Hale & Norcross side was advanced 10 feet; total, 188 feet. The last 10 feet of this drift shows improvement—the ore is better grade. On the 1400 level east crosscut No. 2 was advanced a total distance of 54 feet to the east clay wall of the vein. No work done in the mine on the 4th and 5th.

HALE & NORCROSS.—The joint winze from No. 5 east crosscut on our south boundary is down 105 feet below the 1400 level; the bottom is in the foot-wall of the vein. We have had to retimber a portion of the north winze. Have not done any work in the north and south lateral drifts started from the new station 50 feet below the 1400 level since last report. On the 1500 level the south lateral drift was advanced 20 feet; total, 160 feet from station; face in porphyry and seams of quartz. The north lateral drift on this level was advanced 10 feet; total, 180 feet from station. No. 1 west crosscut started at a point 75 feet north from the incline was advanced 50 feet; face in low-grade quartz. No. 2 west crosscut, 75 feet north from No. 1, was advanced 10 feet; face in quartz carrying some pay ore. We have started two new crosscuts east from the north lateral drift, 1500 level. No. 1 east crosscut is started opposite No. 1 west crosscut, and No. 2 east crosscut is started opposite No. 2 west crosscut. Each of these crosscuts is advanced 10 feet. No work done in the mine on the 4th and 5th.

SCORPION.—The joint north drift from the 900 level of the Union shaft was advanced 18 feet; total, 209 feet from shaft station; face in soft porphyry and clay slips. The water coming in the face shows no increase since last report. No work in mine on 4th and 5th.

Tuscarora District.

DEL MONTE.—Times-Review, July 10: Joint west crosscut extended 21 feet, seams of good ore showing in the face of crosscut.

NAVajo.—South intermediate, 350-foot level extended 13 feet showing small seams of ore. The stopes are looking about the same.

NEVADA QUEEN.—South drift, fourth level of Commonwealth, advanced 11 feet. Low grade ore cut by east crosscut is coming in the face. West crosscut extended 10 feet.

BELLE ISLE.—Line crosscut, 350-foot level, extended 25 feet, the face looks very favorable for ore. No. 1 winze west, same level has been sunk 12 feet, the ore is looking very fine in the bottom. The stopes are looking well and have yielded 12 cars of first and 29 cars of second class ore.

COMMONWEALTH.—Fourth level—No. 1 winze sunk 21 feet, ore two feet wide of fair grade, strong flow of water coming in the bottom. No. 2 raise extended up 10 feet exposing 20 inches of ore, some of it being high grade. Work in north drift was suspended while starting winze and raise, but is going ahead now.

NORTH COMMONWEALTH.—Ten cars ore hoisted, average assay of car sample \$419 per ton. Third level—Joint west crosscut advanced 21 feet, passing through seams of good ore, flow of water is decreasing. Fourth level—Raise has been carried up 17 feet, 25 feet more will connect with third level.

NORTH BELLE ISLE.—East crosscut from 450-foot level Belle Isle, extended 10 feet, rock still very hard. No. 2 east crosscut, 400-foot level, extended 13 feet, still in quartz ground giving low assays. Have started an upraise on the east vein, same level, to prospect the vein above, progress 12 feet. West crosscut from the 600 station extended 14 feet, rock not so hard, and is beginning to show more water. East crosscut, same place extended seven feet, rock extremely hard.

White Pine District.

HAMILTON LEAD MINES.—White Pine News, June 7: Late arrivals from Hamilton inform us that interest continues to increase in several of the lead mines in White Pine district, and several mining experts from San Francisco have lately been there examining the properties. The most important of these—as they are the most developed—is the Cornell group on the eastern slope of White Pine mountain, owned by Tom Cornell, one of the old standbys of the district. Our informant says that the week before last, seven miners took out over 800 sacks of ore, running over 200 pounds to sack, which carries 65 per cent and about \$25 in silver. The net profit on this ore after mining, shipping and reduction charges are paid, is about \$30. The lead in the ore pays all expenses and leaves a profit of \$5 per ton on the lead alone to the owner. Mr. Cornell has, we learn, had several good offers for the property, one being for \$40,000. This would have been accepted, but the purchaser wanted time on half the money. Mr. Cornell thinks there is ore enough in sight to warrant the price offered and he wants it in cash down. Besides what is in sight, the possibilities are certainly very great. It's a poor man's mine, and if Tom doesn't get his figure he will continue to work it himself and grow rich slowly. There are several other good mines in the vicinity of the Cornell group, one of the best being owned by the McAllen Bros., from which they have shipped considerable good ore. They are now running a tunnel to tap the vein at greater depth. Roco Kragnaiz, another old-timer, is working eight or ten men on his mine on Babylon Hill, near the crossing of the Hamilton and Sherman road, and taking out and shipping considerable good-paying ore. He thinks of increasing his force to 20 men. There are many other good prospects in the base belt upon which their owners are now at work, which in time promise to show up as well as those above mentioned.

ARIZONA.

CROWNED KING.—Prescott Courier, July 8: The above-named mine is in Bradshaw district, about forty miles south of Prescott, and close to the Tiger mine. To get to it, one travels mostly through a high, timbered country. Jack Martin, foreman of the Crowned King, spent the Fourth in Prescott, and we squeezed out of him information which enables us to print the following: Mine is opened by three tunnels. No. 1 is 1050 feet long; No. 2, 550 feet; No. 3, 60 feet. No. 1 is 400 feet below the surface; No. 2, 250; No. 3, 50 feet. There is a shaft 50 feet. Tunnels have water. Vein averages 2½ feet in thickness. Ore, lead and sul-

phurets. Sixty tons of concentrates, worth from \$366 in \$397 per ton, were shipped, via Prescott, in the past three months. The gold is worth \$19 an ounce. In this time seven carloads of ore were shipped and 1,500 tons run through the mill. Mill's capacity, about 20 tons a day. All of this ore and the sulphurets had to be packed in sacks, on animals, about 15 miles, then hauled 35 miles, in wagons. Costly business, all will say. N. C. Sheekles has had charge of the mill. Has been ably assisted by Thos. Bowe, W. N. Cook, Henry Brown, Ed. Inward, Geo. E. Stone, Jerry Geren, W. S. Achner, Tom Smith and Al Skinkle. O. F. Place is one of the owners. More Frue-Vanners will be added to the plant. The mine is about 6,000 feet above sea level. It is surrounded by many more good gold and silver properties, and it is a great pity that there is not from this town to the district a direct road over which wagons can be taken.

WREN.—Jasper Phillips, lessee of this mine, is here, making another shipment of high-grade ore. He employs several men, and their efforts have been well rewarded.

BLACK HORSE.—John Sugden says men are sorting dumps. Mine quite wet. Machinery not sufficient to manage the water. Mr. Hall will work some of the ore.

ANTELOPE.—W. H. Durrutt says placer ground near Peeples Valley continues to pay well.

CONGRESS.—This wonderful mine keeps right on giving up rich sulphurets ore. The big mill is a great concentrator. Shipments are frequent.

VULTURE.—A new pipe line will soon be put in. Large bodies of gold ore that will mill from \$8 to \$12 a ton exist in the mine.

GLOBE DISTRICT.—*Silver Belt*, July 4: The first half of the year 1891 was a season of unusual prosperity for the copper mining industry of Globe. Favored by good weather the greater portion of the time, no serious interruptions to teaming were suffered, and an excellent demand for Globe copper, which ranks second only to Lake copper, has stimulated production. It is unnecessary, perhaps, to add that the supply of ore has been abundant. The Old Dominion Co. has had two furnaces in blast and the Buffalo one almost continuously, and notwithstanding the large quantities of ore smelted the supply is undiminished, the Old Dominion Co.'s mine especially showing fat ore bodies. The output of the silver mines of Globe district has also been considerable. Pioneer, Richmond Basin, Quartzite and other localities in the district have contributed to swell the production of silver, most of which has gone to Eastern reduction works for treatment. The Rescue S. M. Co., by far the largest producer, has mined more than 300 tons of ore assaying \$300 or more per ton in silver. None of this ore has yet been worked, repairs to the company's mill having consumed a longer time than was expected. Another week will see the work on the mill completed, when it will be started up for a long run. Globe is turning out more metal with less fuss and bluster than almost any other camp in the Territory.

BRITISH COLUMBIA.

HOT SPRING DISTRICT.—Nelson *Miner*, July 2: Reports from Ainsworth are, that the outlook for Hot Springs district was never brighter. Mining men are arriving there daily, and the boys who own prospects are acting wisely in offering claims at very reasonable figures. During the week Richard Ashworth purchased the Old Timer outright from Frank Ernest and George Schroeder, paying them \$2000 for it. Mr. Ashworth also secured a 60-day working bond on the Glangary from William Franklin and Alec McLeod. The price to be paid for the claim is \$6000. A force of men under the foremanship of Ed Roche, was at once put at work timbering the shaft preparatory to sinking on the property. Mr. Ashworth passed through Nelson on Monday on his way out to purchase machinery. Scott McDonald, superintendent of the McCune company, expects the crosscut started from the 200-foot station on the Skyline to reach the ledge by the 10th of July.

THINK THEY HAVE A BIG THING.—A new location near the Morning claim on Toughnut mountain is causing considerable comment. The ore is peacock and gray copper in quartz, and is pretty good looking truck. The discoverers, Harry Ward, Charles Dundee and A. R. Seamen, think they have a big thing, as the ledge is full six feet in width. They have named the find Cumberland.

HOLDS THE KEY TO TOAD MOUNTAIN.—Development work is being carried on on the Dandy in earnest. A tunnel has been started near the west end line, and by the time that is well under way machinery will be on the ground. New buildings for the better accommodation of the men are being erected, and a business air pervades the locality. Mining men generally concede that the Dandy M. Co. holds the key to Toad mountain.

DAKOTA.

SMELETER.—Deadwood *Pioneer*, July 5: When completed the D. & D. smelter will be an almost duplicate of the Parrott smelter at Butte, said to be the best conducted smelting enterprise in the United States. It makes a copper matte the same as Dr. Carpenter will make at the D. & D. smelter later on, having at the present time over 5000 tons of copper ores offered him monthly. The Parrott smelts ores of extremely silicious contents almost as had as the ores of Bald mountain and Ruby basin. It differs from Prof. Hill's Argo smelter in using a combination of blast and reverberatory furnaces, which will also be used by the D. & D. smelter.

IDAHO.

PLACER.—Idaho *World*, July 7: K. P. Plowman is now fixing up his placer claim for next year's work. He ran just two months this year and made a good cleanup.

THE DELAMAR COMPANY.—DeLamar *Nugget*, July 7: The work of doubling the size and capacity of the DeLamar Co.'s present mill was begun yesterday morning. Men have been put to work putting in cribbing in Jordan creek, in order to make room for the enlargement of the mill. The creek will be cribbed and substantially bridged over from the carpenter shop nearly up to the present wagon bridge. The company will at once commence putting in foundations for a large Corliss engine, which will be located close to the creek bank

nearly to front of the present boiler room. This engine will supply power to run a mill of double the capacity of the present one, and new batteries and twice the number of pans and settlers will be employed in the reconstructed mill. It is proposed to complete this work in 90 days, if possible, and it will be carried on in such a way that the present mill will be kept running steadily while the work is going on. The improvements will be principally added to the east end of the mill, and will occupy the ground up to the resort house. The new pans, settlers and pulp tanks will be placed on a line with the present ones, and the engine will be so placed that the belt, to drive all the lines of shafting, will connect with a driving pulley about where the present pulley is located. A new 10-stamp battery, with 950-pound stamps and double discharge, will be placed beside the present battery. An entire new battery of boilers will be put in, and it is contemplated that the new mill can run, with the same, or at a very small increased amount of fuel from what is now consumed. The new pans to be put in will be wooden ones adapted for the use of chemicals which cannot be used in the present iron ones. The present battery of stamps will eventually be replaced by heavier ones with double discharge. The contemplated capacity of the reconstructed mill is 100 tons per day. The plans and specifications are now being prepared for a much larger and finer mill, which will be built between the two little gulches which come into the creek below the present mill. As soon as work is fairly under way to improve the older mill, men will be put to work terracing the side of the hill and preparing the ground for the new mill, but work on the new mill will, probably, not be begun during the present season. When the new mill is completed, it will mean, with the present mill, a capacity of 80,000 tons of ore per year, and the entire plant will be the largest and most complete in Idaho.

MONTANA.

A FINE GOLD PROPERTY.—*Inter-Mountain*, July 11: W. W. Turney of Anaconda is in the city today. Mr. Turney, B. Smiley and Carroll Swain of Phillipsburg are the fortunate owners of what, from all reports, is a bonanza gold mine. It is situated in the Boulder mining district, above Granite mountain, and is the only gold proposition yet discovered in that section, though Mr. Turney says tons and tons of rich gold float can be seen in the timber and around the hills. The property in which he is one of the principal owners is operated under the title of the Royal Gold and Silver Mining Co. It was incorporated in May of this year, though they have been engaged in working their claims for the past two years. These consist of the Etna Extension and Pine Tree lodes, and 160 acres of placer ground. They are situated on a hill and are opened up by a tunnel which penetrates the three claims running on the course of the vein. The tunnel taps the vein 1500 feet from the surface. There are two discovery shafts on the property. The owners have been steadily developing the property and little has been said or heard about their operations, though from Mr. Turney's representations, and he is a reliable gentleman, they have another Drum Lumber. Mr. Turney reports that a great deal of prospecting is going on in the Boulder district. The Nonpareil mine is looking very well, but owing to a rush of water in the lower workings, the company has been forced to suspend until more ample pumping machinery is received.

NEW MEXICO.

THE CARLISLE MINES.—*Solomonville Bulletin*, July 7: There has been steady work and steady improvement going on at some of the mines three miles south from Carlisle, New Mexico, on the Duncan road, for several months, and in the vicinity of Jim Crow ledge. When the old Carlisle mine was closed over a year ago, it resulted in a general prospecting of the country surrounding it, by miners who had been thrown out of work, and it was not long until a rich strike was reported of silver and gold ore on the Jim Crow ledge, and since that time a number of important discoveries have been made in that vicinity. The ore is extremely high grade and the shipments that have been made yielded such satisfactory returns as to attract general attention and to stimulate development work on all claims. Those now at work are enthusiastic over the favorable outlook of the camp.

OREGON.

CINNABAR.—*Jacksonville Times*, July 7: The construction of the furnaces at the cinabar mines is giving employment to about 25 men and Mr. Sinn, the new superintendent, is pushing the work. A large party of eastern capitalists is expected through this region in a short time, with a view of investing in the many mines hereabout. Mineral experts think that the period of development of the quartz mines in this section has just begun. There are over 200 miners reported as being at the Diamond Peak mines already, and before the summer is over many anticipate a genuine boom. There seem to be paying mines there, and those who are first on the ground reasonably expect to secure the best locations. The Anderson mill has been running the past fortnight on a 50-ton prospect from the Pilgrim mine on Wagner creek, and if it pans out as much as \$3 to the ton of rock it is understood that the mine has been sold to a stock company of which Supt. Brand and Manager Koehler of the O. & C. railroad are the principal stockholders.

A VALUABLE FIND.—The other day while operations at the Nelson placer mines were in progress a boulder weighing fully 1000 pounds became detached from the bank against which the Little Giant hydraulic was playing and rolled down into the channel. Later on, when the miners attempted to remove it to the dump, they found that it was literally alive with globules of gold which covered its surface. Just how much gold the boulder contains cannot be known until it is broken to pieces, but S. B. Baisley, manager of the mine, who is authority for this item, says it is the most interesting and, perhaps, the most valuable find discovered in his long career of mining, and is firm in the belief that the boulder at one time was a part of a ledge that he will yet find in prosecuting his great tunnel through Carpenter mountain, and for the prosecution of which a company has been formed, backed with ample capital.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 7, 1891.

- 455,588.—BALANCE SCALE—Erastow & Rice, S. F.
455,596.—SECTIONAL CAM FOR STAMP-MILLS—I. K. Cleaver, S. F.
455,589.—CAR COUPLING—F. A. Fox, S. F.
455,590.—CAR COUPLING—F. A. Fox, S. F.
455,537.—ORE SEPARATOR—Good & Thorne, Portland, Or.
455,595.—ROCK DRILL—H. S. Grace, S. F.
455,619.—HOSE BRIDGE—B. E. Henriksen, S. F.
455,630.—DERRICK—O. M. Loveridge, Weaver, Cal.
455,647.—BRAKE-HEAD ATTACHMENT—J. H. Nethercott, S. F.
455,515.—DOUBLE-ACTING LIFT PUMP—O. W. Parker, Oakland, Cal.
455,465.—CAN FAUCET—C. M. Symonds, S. F.
455,523.—PICTURE CANVAS STRETCHER—E. P. I. Widell, Albina, Or.
455,498.—GOLD SAVER AND CONCENTRATOR—W. A. Woods, Santa Cruz, Cal.
455,677.—CRUSHING MILL—J. H. Yeaton, Colorado Beach, Cal.

The following brief list by telegraph, for July 14 will appear more complete on receipt of mail advices:

- California—Thomas C. Churchman, Sacramento, tongue support; Virginia M. Cone, Alameda, noiseless chamber attachment; Salome P. Davis and J. H. Dicks, San Jose, baby carriage; Robert B. Davis, San Diego, wave motor; Axel Johnson, Oakland, assignor to Marshall Improved Window Furniture Company of San Francisco, sash-fastener; Thomas Pepper, assignor of thirty-five forty-eights to H. T. Christian, E. W. Burnham and H. B. Sheppard, San Diego, windmill (continued); William F. Shedd, assignor by mesne assignments to the Electric Street and Station Indicator Company, San Francisco, street or station indicator; George H. Tietjen, assignor of one-half to G. H. Bales, San Francisco, street or station indicator for cars; Jonathan V. Webster, Creston, cultivator.
Idaho—John J. Morrison, Lewiston, vehicle axle coupling.

Oregon—James Gill, assignor of one-half to J. Gill, Portland, device for operating steam-engine indicator; Jane L. Landreth, Marshfield, rolling-pin combined with other implements; Walter J. Monteith, Albany, pliers.
Washington—Joseph Kormel, Goldendale, car coupling; Edward M. Plorat, Puyallup, baling press; Michael E. Riley, Montesano, ice-freezer.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DOUBLE-ACTING LIFT PUMP.—Orrin W. Parker, Oakland, No. 455,515. Dated July 7, 1891. This lift pump is especially applicable upon windmills, but may also be used in other connections. It consists of two independently-acting pumps, the barrels of one of which dip into the well or source of supply, and are provided with a piston, piston-rod and upward opening valves, and the second pump is adapted to receive its supply from the upper end of the first one. A connection is made to the open air between the two pumps so that each one works independently of the other. The piston-rods of the two barrels are connected with the reciprocating mechanism so that the two are reciprocated in opposite directions, and the two barrels while working together are essentially independent of each other. From the second barrel the water may be delivered to any desired height through a delivery pipe having the usual valve and air-chamber like a force-pump. By sub-dividing the work of each pump and making it independent of the other, the inventor is enabled to equalize the pressure upon each of the cranks and the pumping mechanisms, so that only about one-half of the column of water is to be lifted at one time.

BRAKE-HEAD ATTACHMENT.—Joseph H. Nethercott, S. F. No. 455,637. Dated July 7, 1891. This is a device for attaching brake-heads to brake-hams, and it consists essentially, in the hinging of one of the jaws, so that when one of the fastened bolts are removed the break head can be easily slipped off from the beam without disturbing other parts. As usually constructed, the brake-head is provided with two rigid jaws which clasp the beam above and below, and it is secured to the beam by bolts passing through the break-head or flanges which are formed upon it and the brake-beam. When for any reason the brake-head is to be removed from the beam, it is necessary, on account of the proximity of the wheel to the car, to release the brake-beam from the brake-rods and otherwise detach connecting parts so as to allow the brake beam to be moved backward and away from the wheel. It is then necessary to use a pinch-bar or other device to remove the brake-head from the beam, and the latter if made of wood is liable to be damaged in the operation. In this improved construction, the brake-head can easily be slipped off without disturbing the other parts.

SECTIONAL CAM FOR STAMP-MILLS.—Isaac K. Cleaver, S. F. No. 455,506. Dated July 7, 1891. This sectional cam is specially adapted for stamp-mills, and is one which may be easily removed or replaced upon the shaft without disturbing any of the adjacent ones. It consists of a two-part cam, with means for fitting and securing it upon the shaft or removing it therefrom. The construction is such as to prevent any end motion of the cam when it is put together, and also insure its being put on at exactly the right place when ever removed.

HOSE BRIDGE.—B. E. Henriksen, S. F. No. 455,619. Dated July 7, 1891. The object of this improvement in hose-bridges is to simplify the construction so as to make the parts of the bridge easily portable, easily assembled, and extended to furnish a bridge of indefinite length. Each section of the bridge being supported by two pairs of legs, will

stand firmly. A length of ten feet is very suitable for these sections, as it will extend over one line of car-track, and as many of the sections may be united as will bridge over a desired space. In streets where there are four or more lines of tracks an equal number of section must be employed. The construction is such that an entire section can be carried under a car-seat or hook-and-ladder truck or in any other vehicle.

DERRICK.—O. M. Loveridge, Weaver, Trinity Co. No. 455,630. Dated July 7, 1891. This invention relates to certain improvements in derricks, and is especially applicable to what the inventor calls a "hydraulic derrick" for which a patent was issued in Nov. 1, 1891, No. 248,938. The present invention consists in an improved method of securing the sheaves over which the hoisting rope passes at the head of the derrick-mast or the boom, in an improvement in the construction of the mast and boom in sections, so as to prevent winding or twisting, and in the means for securing the sections together. In the construction of derricks for use in hydraulic mining works the masts are often made of a length of 80 or 90 feet, and the booms of corresponding length to enable the workmen to move the boulders in a sufficient distance. When masts of this description are made of a single piece of timber a certain amount of winding and twisting in the length of the masts as the wood seasons is unavoidable, and the result is that if the hoisting sheaves are permanently fixed to the mast or boom in the usual manner and in a perfectly straight line when first put in, they will soon get out of position so that the hoisting rope will not lead fair over them. The improved mast and boom are made in two or more sections, the ends of which are abutted together and secured by clamps. If the timber twists or winds the clamp bolts are loosened and the clamps are turned till the pulley comes into proper line.

Mining Share Market.

The mining share market the past week was devoid of special interest. The pool is evidently carrying out its prearranged program, as outlined by this paper in last May, and confirmed in last month; viz., to have the lowest prices for shares to rule in this (July) month, and toward the close of the month start the fall deal; but the up move at the beginning is expected to be slow until outside confidence is restored, when by showing ore in unexpected localities get the grudeons excited so as to have them take the shares at a good round profit. That the pool has the ability and will unquestionably carry out this program, does not admit of the question of a doubt. If they cannot find buyers on this coast, they will get them in the East. Stocks are better and more closely concentrated than at any time within the history of the Comstock—and to unload the holdings at high prices to what are now ruling, is the next thing in order. As stated by the PRESS in last January, they will show up ore in one of the mines in the North End group, in one in the Middle group and in one in the Gold Hill group, but the Alta group will probably be ignored, the shares only moving in sympathy. The problem now to be solved by outsiders is in which mines the ore will be shown up and in which group the first showing will be made. The persons who guess it will make the most money. In outside mining shares there has been a steady absorption by the various pools in control, and everything now warrants the assertion that more activity will be witnessed soon in them with the Bodies (Bodie, Mono, Bulwer and Standard) making on merit, the highest up move. The Bodie shares were probably never before so well concentrated in the hands of a strong pool, one capable of making a big deal.

There is only one Frank operator in the Comstock shares, and that is Samuel. The Bodie Mining Co. has taken out and is still taking out high-grade gold ore and piling it on the dumps for milling soon, which causes the following ore question: What is the difference between Bodie and an outside stockholder? One is on the dumps and the other is in the dumps.

With D. O. Mills arrival in New York, and he, together with Senator Jones and F. G. Newlands soon to be on this coast, and Col. Mackey, Gen. Hayward and Com. Flood already here, it looks like a big deal in the near future.

From the Comstock mines our advices report that in Savage they are opening up a body of good milling ore that ought to net a large surplus. In Hale and Norcross they are still at work developing the recent find. From Potosi and Bullion our advices are of unusual interest. In Union, important work is being prosecuted. In Andes, they are preparing to show up the "Burning Moscow" ground said to belong to Con. Virginia. It is singular the latter company does not open up the 1400-foot level toward the northern line. In Overman, they are running on higher grade ore, and as all extra expenses (machinery, royalty, etc.) have been paid for, it is reasonable to look for better results soon. In the other Gold Hill mines important prospecting and developing work is under way.

From outside mining districts our advices continue of a cheering character from the Tuscaroras, Bodies and Quijotas. In the former district they appear to be developing considerable rich ore in three different mines. In the Bodies, they are still taking out from Bulwer the \$50 ore we mentioned last year. In Mono, prospecting is being done. In Bodie they are nearly through with the deadwork preparatory to showing up the rich ore run into last year. While doing the deadwork they have taken out several hundred tons of high-grade, over \$50 a ton, ore, and expect to take out considerable more before opening up and extracting last year's rich find of ore.

Mining shares opened this (Thursday) morning more active, but at lower prices with several brokers selling out their clients' stocks—all stocks sold were taken in by the pool's broker through other brokers. Under the Supreme Court's decision on Margin dealing in stocks, those brokers who sold their customer's stocks may yet be called on to make up the loss met by those who were sold out. It is a dangerous proceeding on their part, no written agreement or contract can substitute an agent for the principal, and the sales of customers' stocks on any such agreement will not hold, and the agent or broker is liable under the Supreme Court's decision. The only safe and sure way is to transfer the ownership of the stock, advance money on it and then any written contract will hold good.

MECHANICAL PROGRESS

The Micro-Structure of Steel.

At a recent meeting of the British Iron and Steel Institute, M. F. Osmond, of Paris, contributed a note on the above subject, and presented to the Institute a series of micro-photographs, which were exhibited last year at the Mining Exhibition, held at the Crystal Palace. Very mild steel is formed of polyhedral grains of almost pure iron, in each of which the iron presents a crystalline orientation, which is constant for the same grain, but which varies in the different grains. The grains of iron appear to be surrounded by foreign matter, carbide of iron. As the temperature is raised, the grains at first increase in size without changing their form, then they become elongated and form a group of parallel hands.

In steel of medium hardness the white portions consist of almost pure iron, and the dark portions consist of a mixture of iron and carbide, the "pearly constituent" of Dr. Sorby. In metal properly heated and well worked, the pure iron forms torn-up and discontinuous stripes; but when the temperature is raised, the formation of polyhedral grains becomes more and more evident, until the pure iron completely envelops these grains, and grows into them under the shape of fine parallel hands.

In hard steel, the pure iron behaves in a somewhat similar manner, but it is, of course, of much less frequent occurrence. He succeeded in obtaining for this metal a photograph, which shows when magnified, 300 diameters, the alternately dark and brilliant stripes, discovered by Dr. Sorby, and considered by him to be alternate lamellæ of iron and carbide of iron. Independently of any theoretical interpretation, one fact is clearly indicated by the photographs. This is, that each preparation defines not only the hardness of the metal, other things being equal, but also the temperature at which the metal was allowed to slowly cool. Moreover, as the structure and the mechanical properties are intimately associated, it can be easily imagined, without it being necessary to enter into fuller details to what extent microscopic investigations may furnish useful information.

NEW PROCESS IN IRON MANUFACTURE.—A series of experiments were recently conducted at the Crown Point Foundry, Leeds, according to the London *Colliery Garden*, with a new aluminium flux called *Stephenite*, from the name of its inventor, the late Mr. Stephen, of Birmingham. The patent flux, which is composed of alumina and emery, contains about 70 per cent of alumina. In its natural state this flux is not volatile like the refined commercial aluminium, but in a blast furnace, or reverberatory furnace, it gives off its metallic gases or vapors, which unite with the fusible iron, for which they have great affinity, and which acts as a condensing agent, whilst all impurities go to the liquid slag and are drawn off in the usual manner. Metal manufactured by means of this flux, it is claimed, will work equally well under the hammer with the most malleable wrought iron, and will harden up to the hardest steel. It is also stated that the metal will work over and over again, becoming hard or soft at the will of the operator; and tests have proved that in its soft state it will stand a tensile strain of 38.3 tons on the square inch, and when hardened 48.3 tons per square inch. Another point upon which stress is laid is that the use of the flux causes the iron to flow in a much more liquid state, and to remain in that condition a considerable time longer than by the ordinary process, thus preventing blowholes and faulty castings. By means of this invention, the promoters affirm, iron foundries will be able to make their own steel castings, independent of steel-works, by simply melting scrap steel in their own crucibles. In experimenting, the cupola was charged in the ordinary way with common pig iron and coke, and then the flux, which is in the form of briquettes, was added. In due course the molten metal was run off, and several castings were made. Some of these were immediately chilled, and examined by experts present, who considered the experiments had been successful.

THE RECOVERY OF METALLIC IRON FROM SLAG.—Mr. Walter J. May writes to London *Iron* in regard to recovering metallic iron from slag as follows: In very many cases the slag as taken from the furnace will be found to contain a large amount of iron in a metallic state, and which would well repay for any moderate outlay in its recovery; but one of the primary points is that all the work must be as nearly automatic as possible. The separation of the metal from the slag offers no difficulty, as a magnetic separator will effect this readily enough, and with a revolving separator having a series of magnets, part of which are out of current alternately at all times, the whole of this business is quite automatic. The troublesome part of the affair is the disintegration of the slag, and where this has to be taken from the old banks, it is a tough job, and an expensive one to get it in pieces sufficiently small to be first passed through a stone-breaker and then milled. The process I should personally adopt is as follows: Two fairly large pools of water about 10 feet deep would be formed, and run out over these would be a couple of truck-toppers, having the roads of which they formed

the ends at a fair height above the water. The slag truck would be "kicked" on to one of these by the engine, and the slag "ball" in its semi fluid state would be cast into the water, causing somewhat of an explosion, no doubt, but at the same time being broken up into small portions. Of course no one would be near enough to be scalded at the time. When one pool of water was sufficiently full, the water would be run off, the slag trucked up to the mill where milling was necessary, and the pool put in readiness again to receive the slag, after which the other pool would be emptied, and so on. This would save the first cost of blasting the old slag, and although a crude way of working, would be effective for the purpose intended. The milling and crushing processes would only be continued to the point where the most effective result would be had, and the total cost should be repaid by the recovery of 2½ per cent of metallic iron, anything over being profit.

MACHINE FOR MAKING STEEL BALLS.—In connection with the introduction of ball bearings for machine tools, an ingenious machine for rolling steel balls has been invented by Charles Fairbairn, of Manchester, England. This machine is provided with two horizontal disks, each having on one of its faces a spiral groove starting from near the rim of its disk, and ending near its center, with a feeding rim round the edges, the shape of the groove being half round in section. These disks are placed one above the other, with their faces in contact, and in this position are rotated in opposite directions. In the center of the lower disk there is a hole through, and the spiral groove ends in this hole. If a heated bar of steel is presented with its end to the disks so that it enters between them, the feeding rims in the disks grasp the rod and draw it forward until the outer ends of the spirals meet at the end of the bar at each revolution, and acting like shears, cut off a short length of the bar sufficient to make a ball. By the rotation of the disks, the steel is rolled around in all possible directions, and at the same time compressed in the grooves, which ultimately give a perfectly globular shape to the steel and deliver it to a bore, through which the perfected ball drops from the machine.—*London Engineer*.

A GERMAN GUN FOUNDRY FOR CHINA.—The Chinese are just laying aside their antipathy to modern inventions and progress. The last report from Europe is to the effect that Messrs. Krupp are negotiating an important contract with the Chinese Viceroy, Li Hung Chang, for the construction and fitting of a factory for cannon and small arms at Tientsin. The place of the factory is to be near the Kaiping coal fields, and Krupp are to undertake the establishment of the factory and the working of it for a certain number of years, after which it will become the property of the Chinese Government, Krupp meantime to have a monopoly of the manufacture of the articles produced by the factory. It is further stated that the negotiations are being carried on by the German Minister in China, and that he has paid for the concession in the shape of diplomatic complaisance, the precise nature of which may appear later on. At present it is said not to be unconnected with certain advantages obtained by the Chinese in the discussions preceding the recent Imperial audience to the foreign representatives in Peking.

TWO CYLINDERS IN ONE.—A novel method of constructing compound locomotives which is almost as radical as the idea of compounding itself was, has been put into practical and successful operation by F. W. Johnstone, superintendent of motive power of the Mexican Central Railway. Coal costs about \$11 per ton on the Mexican Central, and Mr. Johnstone undertook to reduce fuel consumption by the introduction of a compound system of his own in which the high-pressure cylinder is encircled by the low-pressure cylinder.

The high-pressure cylinder is 14 inches in diameter, and the low-pressure cylinder has a diameter of 30½ inches, which is equal to a cylinder 24½ inches in diameter. The stroke is 24 inches, and the two rods of the low-pressure piston are coupled with the single high-pressure rod to one crosshead. In a competitive test of 12 trips with a single engine the compound locomotive showed economy in fuel of about 25 per cent., which means a great deal on a road where the fuel account is the largest item of operating expenses, being 22 per cent of the total.

CUTTING OFF STEAM.—Just exactly where the length of the cylinder of a steam engine should be cut off to give the best results in steam consumption, says the *American Machinist*, has never been plainly determined. Then outside this there are other considerations that call for figures. Altogether, the subject is a complicated one.

A LUMINOUS HARNESS.—A harness that looks luminous in the dark has been invented. It is intended to prevent collisions between vehicles at night.

The portion of a locomotive the most subject to wear is the crank pin, its life being 60,000 miles; 66,733 will constitute the life of a 33-inch wheel.

FIFTY ONE metals are now known, as against seven 400 years ago.

SCIENTIFIC PROGRESS.

Chemistry In Mining.

Tempering Steel Tools for Mining Purposes.

Coisels, drills, and picks, require careful treatment in sharpening and tempering. The student ought first to know that steel is a compound of iron and carbon; indeed it partakes more of the character of an alloy than that of a compound. So much is this the case that when some varieties of pig iron are examined the graphite or carbon may be seen as a distinctly separate crystallization. Cast iron contains from two to five per cent of carbon, and steel contains from 3. to 1.8 per cent. Carbon is removed from cast iron by oxidation, cast iron being melted in the puddling furnace bottom and riddled by the puddler in such a way that the surface of the metal is constantly exposed to the oxidizing influence of the atmosphere when the carbon is burnt out, leaving malleable iron in the furnace bottom. Indeed it may be said of iron that it is easily carbonized, and easily decarbonized. This being the case the smith has to exercise very great care in heating steel for sharpening purposes. If the temperature be too high the steel is decarbonized and rendered worthless. Tools ought not to be heated to more than blood red, and quickly hammered into the required shape. During the process of tempering steel, if the skin of the tool be cleaned, certain colors are seen which denote the molecular changes going on at different temperatures. To understand this clearly take a bar of steel with a clean skin, which has previously been made very hard by plunging it into the water when red hot, and slowly heat it, when a wave of straw color will pass over the surface; next on a further increase of temperature the straw will change into purple, and still further heating the purple will change into a blue color. Now each of these colors are indices of different degrees of hardness, the straw being hard, the purple less so, and the blue moderate hardness; that is supposing the bar of steel to be immediately cooled at the moment the particular color is seen. In cooling off a tool care must be taken not to produce a line of fracture. This may be illustrated with a common glass bottle. Set a bottle into a dish and carefully pour hot water into the dish until the bottle is immersed to a depth of two inches; if the bottle be now taken out of the dish, and slightly tapped, the bottom will fall off, because a line of fracture has been produced; the expansion of the heated molecules of the glass have torn themselves asunder from the cold or unexpanded molecules; precisely the same thing occurs with steel if heated or cooled carelessly. On tempering a drill or chisel, if the chisel be held steady with a certain line coinciding with the surface of the water, the chisel will break at that line when it is put to use; but a thoughtful temperer gives the tools an upward and downward motion in the water when cooling off, so as not to produce a line of fracture. Mining tools of all kinds ought to be tempered in coal tar and not in water; the tar being a bad conductor of heat is less apt than water to produce a line of fracture, besides the chemical action is such that the tar restores the carbon lost by heating in the fire.—*Ex.*

Atmospheric Moisture.

It is not to be wondered at that the ancients regarded water as one of the elements of which all things are composed, for it is a truth demonstrated by modern chemistry that almost all natural objects contain a large proportion of water. Not only the plants that drink the summer showers and show by their juicy succulence that they have incorporated the liquid streams into their substance, but the very soil in which these plants grow, and the solid rocks themselves, contain a large proportion of water. And when we take away from animals, and even from man himself, the water which they contain, the amount of solid residue left behind is surprisingly small. It is true that in all these cases our senses give evidence of the presence of water, and do not require the corroborative testimony of chemical analysis. The moisture adhering to soil and to rocks, the juice of plants and the blood and other fluids present in animals, all evidently acknowledge water as one of their chief constituents, and testify plainly to the presence of this liquid. But if we were to suppose that water is always absent from these substances, which to our senses give no evidence of its presence, we should commit a great mistake. The dry and solid rock consists largely of water; and clay, though baked in the summer sun and dried in the summer breeze, cannot be robbed of all its moisture. When the washerwoman buys 14 pounds of transparent and apparently perfectly dry soda, she in reality pays for nine pounds of water, and gets but seven pounds of real soda, instead of the 14 that she supposes she is getting. In short, water is present everywhere—in the dry wood that has for years formed our furniture, and even in the apparently perfectly dry dust that blows about our streets. Even the air, on a dry and sultry day, when everything is parched, and when every breath seems to burn our throats, is charged with moisture. That warm and apparently dry air contains moisture is easily proved. An ice pitcher becomes covered with dew, not because the pitcher sweats

through from the inside, as it is said to do, but because the water held in suspension by the hot air, even when apparently dry, contains a considerable amount of moisture. Procure a small quantity of salt of tartar, a cheap drug that may be obtained from any apothecary, and on a dry day lay it on a common plate and expose it to the atmosphere. In a short time it will have attracted from the air an amount of water sufficient to dissolve it, and it will have become converted into an apparently oily liquid, called by the old chemists, who did not fully understand the changes that take place, oil of tartar. The experiment will be more convincing, perhaps, if the salt with its containing vessel—which in this case, however, should be as light as possible—he placed in the pan of a moderately delicate pair of scales and carefully counterbalanced. In this case the abstraction of the moisture from the air is rendered evident by the gradual increase in the weight of the salt, and the descent of the pan in which it is placed.

If, then, moisture may be regarded as everywhere present, it becomes a nice point to determine when anything, such, for example, as the air we breathe, our houses, bed, clothes, etc., may be considered damp. To look for perfect dryness would be a vain search; nor would it do us much good if we could find it. Perfectly dry air would remove the moisture from our bodies so rapidly that we would wither as if smitten with the blast of the simoon. In such an atmosphere our throats would be parched as if in an oven, plants would wither and nature become one universal desert. But on the other hand, air that is too moist, that is to say, air that is really damp, produces effects that are equally disastrous. In such an atmosphere metals rust or corrode, vegetable matters rot, and the growth of fungi, such as mildew, mold, etc., is greatly promoted.—*American Engineer*.

THE RECENT GUNPOWDER EXPLOSION near Rome has excited considerable interest from the fact of some careful scientific observations which the explosion made possible. The amount of gunpowder exploded was quite large—about 50 tons, and the effect was, of course, very terrific. The magazine being located between two hills the main force of the explosion was upward, the pressure of the air quite uniform everywhere, producing some very interesting scientific phenomena. The action of the blast manifested itself in two ways—by an earthquake and by an air-wave. The vibratory movement of the earth traveled with greater velocity than the air-wave; so much so that the shock was felt in the city and the suburbs several seconds before the report was heard. Flower-pots, lamps and bottles were upset in closed rooms protected from any rush of air. The blast set the barometrical column in violent motion, beginning with a pressure of about 550 pounds per square meter, followed by a counter wave of suction. The first was marked by an increase of 14 millimeters in the barometer, the second by a decrease of 14.11-25 millimeters. The power of suction of this last wave was such that 90 per cent of the windows were blown not inward, but outward, the fall of broken glass in the streets wounding some 300 passers-by. The movement in barometrical column lasted 66 seconds, although it is believed that one-third only of that prodigious mass of powder had time to ignite. The greater portion was blown up bodily, its explosion taking place gradually. Grannies of powder were collected as far distant as Ponte Milvio. The report was heard and registered not only at Schiavo, Viterbo and Anagni, but also at Caserta, Ischia and Pesaro, at a distance of more than 200 miles.

TWO NEW FORMS OF SULPHUR.—Two novel modifications of this most Protean element have been recently discovered by Engel, says *Industries*. The first, like that proved to exist in Wackenroder's solution, is soluble in water and very unstable. The other is crystalline, soluble in carbon disulphide and chloroform, and polymerizes slowly in the cold, and quickly at a temperature of 100° C., but unlike prismatic sulphur, which changes on keeping into the octahedral variety, it becomes converted into the white insoluble form which commonly constitutes so large a percentage of the material known as "flowers of sulphur."

IMMENSE DYNAMOS.—Five electric dynamos of 10,000-horse power each are being built to be placed at the Deptford Central Lighting Station at London. These machines are veritable giants in proportions, and are designed to operate 200,000 lights each. Complete they will be 45 feet in height, each with armature ring 35 feet in diameter, the armature and the shaft will weigh 225 tons and the field magnets 350 tons more, making a total of 575 tons, not including the massive bed plates upon which they will stand. An engine 48 feet high will be attached to each end of the armature shaft.

ARTIFICIAL PRODUCTION OF RAIN.—Preliminary experiments for the artificial production of rain have already been made in the vicinity of Washington. It is expected that the ornamental experiment will soon be undertaken in some locality in Kansas. So much has been said and written, pro and con, in regard to the project of producing rain by means of explosives at some considerable elevation above the earth that the results of the forthcoming efforts in that direction are looked for with much interest.

GOOD HEALTH

Intemperance Successfully Treated as a Disease.

There is an institution at Dwight, Illinois, which has been in existence for a number of years, where intemperance is treated as a disease and cured. The institution has become quite famous, and from all accounts the treatment appears to be a decided success. People go there from all parts of the country. Professional men from the highest walks of their profession; business men—in fact all classes and vintime to all manner of slavery, from men who drink paregoric to opium fiends of the worst imaginable type, and 95 out of every 100 are said to return to their homes cured of their affliction.

A Pittsburg (Pa.) paper, in speaking of this institution, says that it is one of the most wonderful discoveries of all time for these habits, and thousands upon thousands of homes are being restored and made happy once more by this remarkable man. The paper adds that there are a dozen or more well-attested cures from Pittsburg, most of which were given up as about hopeless long ago.

That intemperance, when long continued, develops into a disease entirely beyond the control of the sufferer, and which can be made to yield only to the action of medicine, is a theory which has long been maintained by many, but which is now fast becoming acknowledged by the great majority of medical practitioners.

Dr. Leslie L. Keeley, the founder of this institution, has long held to this theory. He is a practicing physician of the allopathic school and surgeon of the Chicago & Alton Railroad. He has been long at work with his cure, but the world in general has heard but little of him, because he had been full of business and has preferred to become more generally known through the results of his practice. It is said that he has successfully treated over 6000 patients during the last ten years, fully 95 per cent of which have been reported as permanent cures.

He has made no effort to advertise his cure, probably in consequence of the absurd practice of the profession that such a course is held as unprofessional, and any one who so offends is boycotted by his medical associates.

Whether the remedy is secret or not we are not informed. The information at hand simply informs us that the patient may come to the Doctor either drunk or sober—it makes no difference which. The treatment is daily and consists of the administering of a hypodermic injection of "a bright red liquid," which is done at the office. The patient is then given an eight ounce bottle of "bichloride of gold mixture," which he takes to his room. A teaspoonful of this mixture in a quarter of a glass of water is to be taken every two hours while the patient is awake. The hypodermic injection is administered three times a day—morning, noon and night. The time of treatment generally occupies about three weeks, although it is sometimes extended to four. The hypodermic, from the account before us, seem to be intermittent—administered a few days and then withheld for a few days, according to circumstances of the case. The basis of the cure appears to be the bichloride of gold mixture, which is taken internally.

There is no need that liquors should be kept away from the patients. The Doctor keeps them in all variety in his office, and deals them out freely in drinks to any of his patients who wish them; but after two or three days' treatment they become nauseating to the patient and are refused. After a complete treatment, a person would be obliged to do violence to his appetite and will in drinking any kind of spirituous liquors, but by doing so repeatedly he may create a new appetite for the intoxicating cup. But it is almost incredible that any one who has passed through the fires of such a disease would deliberately go to work and kindle them anew after they have been once extinguished.

We have condensed the above from an account written by a New York gentleman who has recently been taken successfully through the "treatment." The writer, who is evidently a gentleman of standing and well informed, occupies three columns in the New York *World* in his well-written narration, in which he says: "I have stepped out of the shadow into the sunshine—out of the darkness of death into the golden glory of life. So firm am I in the belief of the great work of healing and physical reconstruction accomplished for myself and thousands of others at the little village on the prairie of Illinois, that I cannot rest until I tell the story to those who have known me in the city of New York, which has been my home for almost half a century."

So much interest and importance attaches to the above that we have taken steps to learn directly and through an independent source the full truth in regard to it, which, when it reaches us, we shall place before our readers in full. We have seen a number of references to this alleged "cure" in our various exchanges, but never before have met with such a full and apparently truthful report as the one from which this account has been condensed.

WEARING A BADGE.—It is stated that workmen in Japan usually wear on their caps and back an inscription giving their business and employer's name.

USEFUL INFORMATION.

CAUSE OF IRRIDESCENCE IN OLD OR ANCIENT GLASS.—Examples of ancient Cyprian glass were noted for their gorgeous iridescence, unproduced by artificial means. So far as is at present known, this effect can be produced only by the corrosive action of the air and moisture of the soil in which these objects have been buried for centuries. A microscopic examination of this glass shows that the surface is covered with exceedingly thin transparent films formed by matter dissolved from the glass. The body of the glass is pitted over its entire surface with minute cavities, which are spherical, elliptical or oblong in outline, and either spherical, ellipsoidal or cylindrical in respect to their concavity, and the films conform to the pitted surface of the glass. These films, of which there are many superposed, are so thin as to float in air like down when detached. They decompose the light by interference due to reflections from the front and rear surfaces of the film, and give rise to the gorgeous play of color.

ALABAMA SURPASSING PENNSYLVANIA.—The Washington correspondent of the *Philadelphia Ledger*, states that a forthcoming census bulletin will show that Alabama produces in one year more iron ore than Pennsylvania. The importance and significance of this statement are evident when we reflect that Pennsylvania has long been the great iron center of the country. That a Southern State should now take first place indicates a remarkable shifting of capital and industrial forces. The *Ledger* correspondent admits that "the South will be the future iron-producing center of the United States." The superintendent of the census is quoted as saying that the three future centers of iron manufacture will be Puget Sound, on the Pacific Coast, Birmingham, East Tennessee, and North Carolina, in the South, and the Pittsburg region in the North.

A PURPLE METAL.—It is reported, says *Iron*, that Professor Roberts-Austen has discovered a new alloy of gold and aluminum, the precious metal being present in the proportion of 78 per cent. It is described as the most brilliantly colored alloy as yet known. Its color is a rich purple, and by the reflection of light from one surface of the alloy to another bright ruby tints are obtained. Other alloys of the metal with gold have also been known; 1 per cent of aluminum gives the precious metal the color of green gold, and there is a very white and hard alloy containing 10 per cent of gold.

AN ENGLISH CENSUS is taken in a single evening, and within two hours of time, and costs only about as much as it does in this country. In 24 hours from the time of "listening," the result is ready to be given out, and as correct as human ingenuity can make it. The English may be slow in some things, but taking a census is not included among those things. Every traveler, tramp and citizen is caught and included. There is no time to dodge, and the officers, which includes the constabulary, are not to be fooled with.

TO CIRCUMVENT CHICKEN-THIEVES.—It is said that a resident of Waterbury, Conn., has devised a new plan to circumvent chicken-thieves. He uses copper rods for roosts, and these he has connected with a battery in his bedroom. When a thief tampers with the hen-coop an alarm rings at the proprietor's head, and by pressing a button a shock is sent through the roost, and the whole congregation of fowls crow and cluck in vociferous noise.

BANANA FLOUR.—A flour is made from green bananas. They are allowed to mature so as to be readily peeled, when they are sliced and dried, then pounded in a mortar and passed through a coarse sieve. The color of the flour is a dirty gray, like ashes. Ripe bananas are sometimes preserved by being dipped in lye and then dried in the same manner as figs. They shrivel up under this treatment, and when eaten taste much like figs.

CHANCE FOR INVENTORS.—There is an opening for an ingenious American to discover, patent and place upon the market an automatic ship-scraper for cleaning the bottoms of iron and steel sailing ships when under way. A wide application could be made of a convenient and portable automaton of this description.—*Marine Review*.

BEER FOR WASHING SILKS.—Probably the best use to which beer can be put is for washing silks. It gives old silk a luster and a new look almost like goods fresh from the loom. Then, too, it gives a little "body" which lasts for a considerable time; but eventually shakes out.

TO REMOVE EFFLORESCENCE FROM BRICKWORK.—A method recommended by *Painting and Decorating* for removing the white efflorescence which often appears on the face of brickwork is to wash the surface with a sponge dipped in a weak solution of muriatic acid.

CRIME IN ENGLAND.—During the past few years crime has decreased to such an extent in England that over \$1,000,000 a year less is spent upon prisons than was the case ten years ago.

ENGINEERING NOTES.

The Ship of the Future

It is common experience with ship-owners and shipbuilders to have propounded to them means whereby even 30 knots per hour may be realized, and these backed up by very elaborate calculations as proof, but which, when investigated, are found, like those of a well known writer of scientific romance, to be wanting in some little detail, insignificant at first sight, but absolutely essential to complete the proof. So far no great departure from the existing form of ship, nor from the method of propulsion, has resulted in obtaining a higher speed than is common with ordinary ships of the same dimensions; and in nearly every case such departures have mortified the inventors as well as disappointed the public by turning out absolute failures; and there is no good reason to suppose that further successes than have already been attained will be achieved in any other way than by improving the conditions that now obtain, both as regards form of ship and method of propulsion, inasmuch as the physical causes which combine to retard the motion of a vessel, and the physical forces which are employed in overcoming that resistance, remain to-day as they ever were, and are—in fact, Nature's immutable laws.

The commercial question is also one that presses very hardly at all times and must continue to do so more and more, as will be seen later on. The Atlantic greyhound of to-day is, in immersed form, substantially that of the Viking's craft of more than a thousand years ago. And if we look to Nature for our study we shall find that the swiftest fish are not unlike in general form to the submerged part of a ship, and the comparison is the more easily accepted when it is remembered that the fish is wholly submerged while the ship is only partially so. The one has to contend with waves and other surface disturbances, and must perforce keep above the water, while the other is free from such disturbing elements and conditions, and pursues its course in practically smooth water.—*Scribner for July*.

THE SUEZ CANAL TOO SMALL.—"The most important deduction," says the *Engineer*, "to be obtained from the annual report of M. Ferdinand de Lesseps to the shareholders in the Suez Canal is that the facilities of the waterway are rapidly falling behind the enormous increase of traffic, and that before long probably even the relief afforded by the recent diminution in the time required for transit, will be found insufficient. The report shows that during the year no less than 3,389 vessels passed through the canal, giving a total receipt of £2,697,000. The principal work carried on in the period covered by the report has been the widening of the maritime canal by 15 metres. This work has been carried from the tenth mile, from Port Said to the fifteenth, and it is intended during the present year to carry it as far as the twenty-second mile. The other widening works also in course of execution have been continued vigorously, and the new basin at Port Said has been excavated to its full width for a length of 300 m. The crowding of the canal is so severely felt that the engineers have determined to abolish the supply of stores, etc., by water to the stations of the company between Port Said and Ismailia. The boats and barges at present employed will therefore be displaced in favor of a steam tramway, which is now in active construction. The Egyptian government has entered into negotiations with the company for the employment of this tramway as a public line for the transport of passengers and merchandise. One other noteworthy feature of the report is the statement that the development in the petroleum commerce of Port Said has rendered it necessary to undertake the construction of an isolated dock at that place for the accommodation of this traffic. At the annual meeting of the company in Paris the whole of the resolutions presented by the committee of management were approved, and MM. Chabrières-Arles, Boucard, Guichard, and Lord Brassey were elected directors.

ANCIENT SHIP RAILWAYS.—It is more than probable that the Egyptians were in the habit of transporting vessels overland across the Isthmus of Suez, and tradition records that 23 centuries ago a true ship railway, with polished granite blocks as rails, existed and was worked across the Isthmus of Corinth, where the construction of a ship canal has been projected. In 1718, the well-known Count Emanuel Swedenborg constructed a road and "machines" for carrying laden vessels from Stromstad to Iddefjord, in Sweden, a distance of 14 miles across a rough country, and the successful use of this work by Charles XII. during the siege of Frederikshall led to Swedenborg being regarded not only as a national benefactor, but as a mechanician of no mean ability for at least a century after his death.

MORE TIME WANTED.—The Chignecto (Canada) ship railway will not be completed as soon as was expected. The company has asked the Canadian Parliament for an extension of time until July 1, 1893. Much interest is felt in the early completion of this work, as it will effectually solve the long mooted problem of the practicability of raising a loaded ship out of the water and transporting it across any given Isthmus.

ELECTRICITY.

Progress in Electric Railways.

Electric railways have become quite common both in this country and in Europe. There are now about 270 different electric railways in operation in the United States, operating about 1160 miles of track. The longest electric railway in the world is said to be in North Carolina. It is 41 miles in length. Considering the rapid progress made in this direction during the last decade, it is not unreasonable to assume that it will not be many years before electricity will supersede steam in every class of railway locomotion. Many prominent engineers think that not only that result will be reached, but that the speed of travel will be greatly increased.

The First Idea of an Electric Railway

Was developed in this country in 1835, when a small model circular railway was constructed and exhibited in Springfield by Thos. Davenport. This was three years previous to the application of the electric motor by Jacobbi in Russia. In 1842, a Scotchman, Davidson by name, built a five-ton electric locomotive, which was tried on the Glasgow & Edinburgh railway. It attained a speed of five miles an hour. The experiment was made in 1847 at Pittsburg, Pa. But no real practical success was reached in this direction until 1833 and '84.

In all the early experiments in electric railways, the motive power was derived from primary batteries of some form, which were carried on the car or locomotive. The great cost of producing electricity by such means necessarily resulted in failure, and it was not until the dynamo solved the problem of cheap electricity that electric railways became practical. The dynamo was first applied to railway locomotion by Siemens in Germany in 1879, the next in Paris in 1881. The first use of the dynamo in this direction in America was made by Stephen D. Field and Thos. A. Edison in 1880.

Boston's Successful Railway.

Probably the most successful and best equipped electrical railway in this country, if not in the world, is to be found in Boston. It is known as the West End system, and last year 114,000,000 passengers were transported over this road. It is thought that the net earnings overrunning expenses this year will be \$2,311,000. The road is a mixed service—a large number of horse cars still running upon some of its branches, but it is intended to change to an entire electric system at an early day. When these changes are all made the capital will be extended to \$16,400,000. The number of cars now running is 2400.

EDISON'S LIGHTS FOR SAN FRANCISCO.—An important negotiation has just been completed in this city by which the Edison General Electric Company will soon have a plant established in this city. On the 1st inst., the Edison Light and Power Co. was incorporated with a capital stock of \$3,000,000, and on the day following, the entire plant, franchises and other property of the California Electric Light Co., used in the central station for lighting this city, was transferred to the new corporation. The consideration for the transfer was \$1,000,000 worth of capital stock in the new company. George H. Roe of the California Co. says the new company will at once begin the construction of a large central station, and will expend \$500,000 within the next six months. The wires will all be placed underground. The arc-light machinery will be transferred from the Jessie-street station to the Townsend-street station, and the former place is to be used exclusively for supplying Edison incandescent lights. As soon as possible the company will establish additional stations in various sections of the city.

ANOTHER ELECTRIC DEVICE of wonderful character and interest is said to have found its way to the front. It is a contrivance by which it is claimed a photograph may be reproduced at a distance by means of electricity. The machine is small in size, and made of iron or brass, designed to be connected with a telegraph battery. A photographic negative, upon which the image is in relief to the extent of about one-thousandth part of an inch, is fixed in position, a trace making a perfect engraving on wax or metal at the other end of the line, from which the print may be taken. When the transmitter passes over a light portion of the subject, the receivers cause a depression at maximum cut, to be made upon the surface, and when, in case of a dark portion being under the transmitter, the receiver makes no record.

ELEVATORS operated by electric motors are growing in public favor for use in private. They are designed to carry three passengers, and the apparatus by which they are operated is described as being very simple and compact.

An important gold discovery is reported about three miles south of Dun Glen, Nev., on the Auld Lang Syne lead.

The 1890 record for British lifeboats shows a saving of 555 lives, besides rescuing 27 vessels from destruction.

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SAN FRANCISCO:

Saturday, July 18, 1891.

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Business Announcements.

(NEW THIS ISSUE.)
Mining Machinery—Parks & Lacy Company.
Ore Concentrators—James Tullock, Angela.
Delinquent Sale Notice—Gray Eagle Mining Co.
Situation Wanted—G. S. Freeland, Pa.
Pipe Work and Laying—Geo. H. Crawley.

See Advertising Columns.

Passing Events.

The institution of a suit against a Placer county mining man by the Government officials makes it look as if the crusade against the hydraulic miners would in future be carried on by the Government instead of by the Anti-Dahris Association. This is a had outlook for the hydraulic mines.

Judging from the reports of the men who have visited the breaks in the Colorado river bank, it is possible that the water will make a permanent lake in the low portion of the desert recently flooded. In that case, the adjacent lands could be cultivated and utilized, as the water could be used for irrigation purposes.

There is a demand for a lower rate on ores from the mining districts of the coast, to reduction centers. The present rates are in many instances prohibitory. A marked reduction would start into life many districts now practically abandoned.

A new tin-mill is being put up at the Temescal mines, San Bernardino, with a capacity of 65 tons of ore per day. The first tin-mill in South Dakota is expected to start up about next April.

The great Pennington air-ship did not fly from Chicago to St. Louis, but went on a freight car.

Freight Rates on Ores.

San Francisco ought to be the Swansea of America; ought to be, but is not. The whole regions of country east, north and south of the city abound in mines of every kind and description. Every variety of ore is available, and available in quantity. From Mexico and the Central American countries ores can be brought by sea, as they can from Oregon, Washington, British Columbia and Alaska. But those regions of our own country not on the coast line, from which the bulk of the ores must come, are dependent on the railroads.

And here lies the difficulty of making this a great smelting center. The railroad companies which control entrance to this city have not yet realized that they can build up the mining industry and make a large business for themselves by charging a much smaller rate on ores than at present prevails. Their schedules on ores need an entire revision and intelligent investigation.

By encouraging the development of mines and shipping of ores, one-quarter of the business of the Union Pacific railroad is now from the mines. The Northern Pacific Company, with this experience before them, are beginning to fall into the same line. But our own local roads have not yet given the matter the attention it deserves, and maintain rates which are to a certain extent prohibitory and calculated to discourage rather than encourage mining.

The Union Pacific, which has built up an immense mining business for itself, charges about three-quarters of a cent per ton per mile on ore. The Central Pacific charges three, four and five cents for the same service; and, moreover, it charges a much higher rate on rich ore than it does on poor. It does not seem to realize that rich ores are scarce and costly to extract, since the very rich ledges are usually small and more expensive to mine. When the high expense of mining and of freight are considered, together with the comparatively small quantity obtainable, the miner quits work in disgust, for he finds little left for himself. We ought to have a freight rate from Grass Valley to this city of not over \$5 per ton, and that on ores from Arizona should not be more than \$7. With those rates thousands of tons would come here. The mining industry of Nevada is languishing because the miners cannot ship their ores for prices which would leave them any profit. There a hundred districts in that State which would be actively developed and support a large population could the miners ship their ores, but which are now practically abandoned and worthless. Arizona and New Mexico would send their ores here if they could, and their mining resources would be developed if freight rates were reduced.

Ores from Chile, Central America and Mexico now all go to Europe for beneficiation, which would come here by sea, were there an extensive plant where ores would be brought as abroad. The plant should be one with a large capital to advance on any quantity of ore that might be offered. The Grant smelter at Omaha and the Globe at Denver think nothing of having 16,000 or 18,000 tons of ore on hand at a time, all purchased from miners. Agents go in all directions to buy up the ores. South of us from the one port of Mazatlan, some \$4,000,000 worth of ore goes every year to Europe to be worked, which we ought to get in this city. But we do not reach out for these distant ores. In fact, the ores near by do not come in the quantities they should by reason of the freight rates.

We have fuel, climate, mines and all conveniences; an ocean in front of us and mines on the other sides. The region, for instance, in Northern California and in Southern Oregon could alone furnish an immense quantity of ore, could it be shipped at reasonable rates. The Northern Pacific charges \$20 per ton for taking ores from Grant's Pass mines, Oregon, to Portland. It depends on the value, what the charge is for bringing ore from any camp along the line of the Southern Pacific roads to this place.

It is high time that the roads centering in this city should make an intelligent examination into this question of ore rates, with a view to enliven the mining industry in this and adjacent States and Territories. The companies have it in their power to increase fourfold the output of the mines of the coast, and relatively increase their freight business in this

direction. Hundreds of camps would start up again if it were possible to ship the ores to advantage. The smelting works now being operated here could increase its plant and its capacity, and would doubtless do so, and there would be business for others as well; but under present conditions there is not much chance for enlargement of the ore-hauling or smelting business of San Francisco. There is no place in the United States with the geographical advantages for a smelting plant that this has, yet we have seen the ore business slip away from us and go to other places where competing railroads brought rates to a point to encourage instead of discouraging the miner.

It is, however, by no means San Francisco alone which would be benefited by lower rates on ores, but other places in California as well. Custom mills, reduction works and chlorination works have been established at different points, which would find their business more than doubled could the low-grade ores of the country be shipped from the mines. Concentrating plants would multiply, and wherever erected the surrounding region would be developed. Many of the interior towns of the State already have works for the beneficiation of ores, and they would all be given more business were freight rates cheaper. In fact, the railroad company has it in its power to greatly assist not only the miners, but the interior towns, and make better times all around if they would investigate this subject and put the rates on a basis which would admit of more mines being worked than there are at present. Colorado and Utah are working thousands of tons of ore annually which are shipped to the reduction works from small mines. There are hundreds and hundreds of unworked mines on this coast which would again be operated could the miners ship their ores without seeling all the profit go for freight.

The Portland Smelting and Refining Works.

We had a conversation this week with Mr. J. J. Gove, of the Portland Smelting and Refining Works, who is here buying ores at Grass Valley and elsewhere for shipment to Portland, Oregon. The works of the company are at Linton, seven miles from Portland, and the first run of three weeks was made a short time since successfully. Ores are purchased in California, Oregon, Idaho, Mexico, and wherever they can be procured. Several lots of sulphurets have been purchased at Grass Valley, which will be smelted. After roasting them, the iron is utilized as a flux for other ores.

The capacity of these works is 80 tons per day. The water-jacketed furnaces, 32 by 76 inches, were made by Fraser & Chalmers. The company intends to do its own refining, having put up a plant for that purpose. This company is not the one which went out of business some time since at Portland, but a new one, with the following directors: J. McCracken (President), N. B. Oatman (Vice-President), O. F. Buoker (Secretary), W. Selover (Manager), Ohas. Hegale, A. H. Johnson and J. C. Moreland.

The lead ores are obtained from the Coeur d'Alene District, Idaho. This district is now producing about 300 tons of concentrates per day, the material being concentrated from three to five into one. Some lots of ore come from around Baker City, Oregon, but not much to speak of as yet. The works have bought considerable Mexican ore. They expect to ship more from the northern counties of California and southern counties of Oregon in the future, provided better arrangements can be made with the railroad company. By sea from this port the freight to their wharf in Oregon is \$2 per ton. With lower rates to tide-water, large quantities of ore would be purchased, which cannot now be handled.

The Government and Hydraulic Mining.

An important mining suit is on trial in this city, brought by the U. S. District Attorney against Mr. James Gleason of Iowa Hill, Placer county, to enjoin him from selling water from his ditch to miners. Usually, cases for injunctions against hydraulic mining have been instituted and prosecuted at the expense of the Anti-Dahris Association, but in this instance the suit has been commenced by Government authorities. If we are correctly informed, this is the first time such a prosecution has been undertaken at the Government expense, and it

is, therefore, more than an ordinarily important case.

It is contended by the miners that they purchased their gravel lands from the Government for the purpose of mining them by the hydraulic process, and that the Government had no right to sell them the mining ground under these conditions, and then prevent them from working it. However, it is evident that the Government, through its courts and officials, is taking a hand in the stoppage of this branch of mining, ignoring any such argument as the miners advance.

Tin-Ore Mills.

The four pneumatic stamps for the new mill of the San Jacinto estate have arrived from Birmingham, England, and will be put up at the Temescal mines six miles from Riverside, San Bernardino county. The mill will have a capacity of 65 tons of ore per day. It is stated that 10 concentrators of a form new to this country have also arrived, though the Frue concentrators tried on the tin ores of the mine were reported as very satisfactory in their working.

The Harney Peak Mining Co. of South Dakota which owns nearly 1100 tin-deposit claims among the Black Hills, has no mill yet, though there are reported to be some thousands of tons of ore on the dumps. They intend to have a mill, however, and count on its being done by next April, when they expect to turn out eight tons of pure tin a day. As soon as the first mill is done they will begin on five others, and the President of the company thinks that by April, 1894, the six mills will all be running. Why they will take so much time to put up these mills, when they have so many mines and so much ore on hand, is not clearly explained. The Dakota tin mines have been known for some years, and it seems strange that active measures have not been taken to erect mills and beneficiate the ore.

The Temescal mines of this State are producing tin and will produce more as soon as the new mill now on the ground is ready for operation.

Silver-Lead Ores.

Assistant Secretary Spaulding, writing from Washington to the Collector of Customs at this port, referring to a letter from the Collector relative to the practice of not assessing duty on the copper in silver-lead ores, says, that according to a report obtained from the Collector at New York, the practice at the latter port is to assess the duty at the rate of one-half cent per pound on copper in excess of two per cent contained in such ores, by virtue of paragraphs 138 and 191. In the opinion of the New-York Collector, silver ores containing any percentage of copper would be liable to duty on the copper contained therein, at the rate of one-half cent per pound, under the provisions of paragraph 191 (N. T.), understood by his office to relate to copper in the form of any ores. As the practice prevailing at New York, and so far as the department is informed at several other ports, does not appear to be inconsistent with a reasonable construction of the provisions of the tariff relating to ores, and has not been made the subject of protest by importers, the San Francisco Collector is advised to adopt the same at this port.

Hoisting Engine for Mines.

The engraving on page 33 represents the Lidgerwood improved double cylinder reversible link motion hoisting engine, with double spur gearing. This latter feature is a decided advantage in all kinds of hoisting, either where the duty is heavy, or where safety is particularly desirable, as the gearing being double—and either set capable of carrying the entire load with safety—the danger from accident is almost impossible, and the strains being equally divided, the engines are more durable. The engraving shows the engine as fitted with automatic safety brakes, which, however, are only put on when ordered, the regular engine being furnished with an improved hand friction brake. This brake, while not absolutely necessary, is an additional security against accident. Every one of these engines is thoroughly tested with steam before leaving the works. The Parke & Lacy Co. are agents for these hoists on this coast.

Slate-Picking Chutes.

In the PRESS last week we gave our showlog the rolls for breaklog coal, and on this page are engravings of the slate-picking chutes by which the slate is separated from the coal at the mine. Originally the coal coming from the screens passed down a simple chute or trough and men and boys picked out the slate as it passed by, but there were several objections to this; as much slate was hidden, it was hard to tell what work each picker did, and pieces having a slaty appearance were often picked up by each slate-picker in succession and returned to the chute.

For these reasons a different type of picking chute has been adopted at the Cross Creek col-

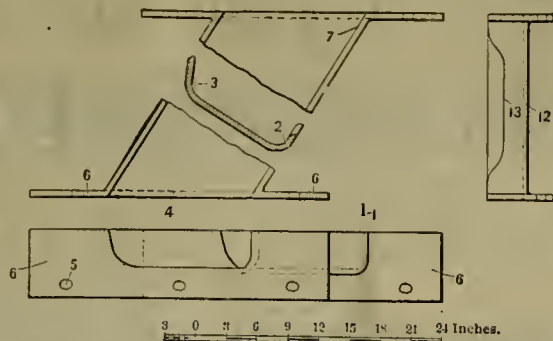


FIG. 1.—EGG AND STOVE COAL INTERMEDIATE PICKING-CHUTES

tility of slate and coal, which has been passed through a screen and properly sized, the slate, if placed edgewise, would drop through a slit over which the coal would pass. The fixed automatic slate-picker, which is of cast iron in one piece, consists essentially of a series of V-troughs, one side of the V being shorter and at right angles to the other. The lower half of the casting has a taper slit (4) on the short side. The slit is so arranged that anything log on the long side of the trough, and of not too great height, can slide out through it. Any lump which is thicker than the height of the slit will, of course, be retained in the trough. The slits widen as they approach the lower end, and the part of the casting below the cross-bar (5) hangs freely, so that there is

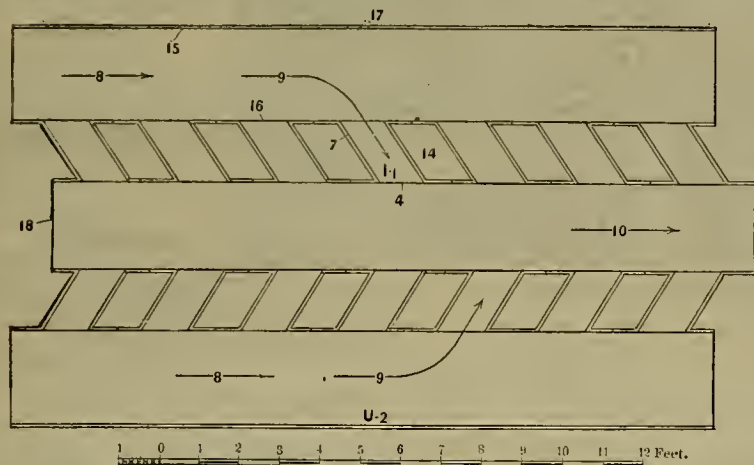
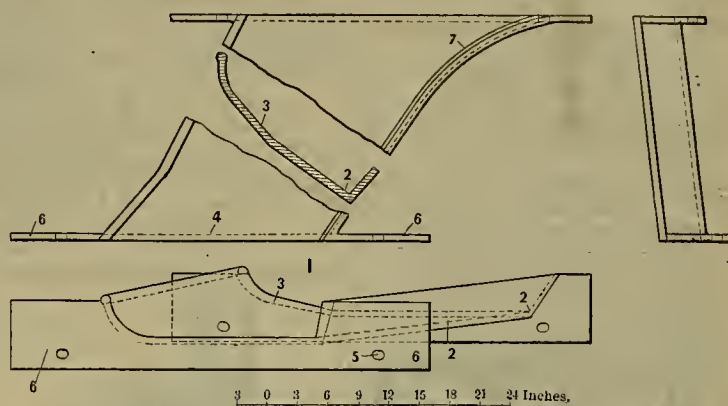


FIG. 2.—EGG AND STOVE COAL COMBINATION PICKING-CHUTE.



BROKEN-COAL INTERMEDIATE PICKING-CHUTE.

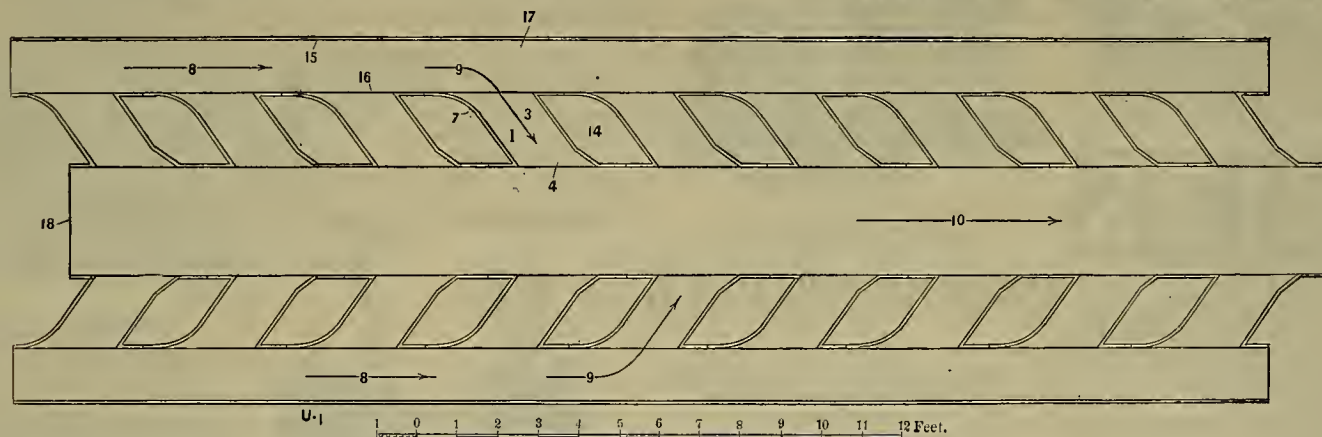


FIG. 3.—COMBINATION OF EGG AND BROKEN INTERMEDIATES.

lieries. It consists essentially, first, of a supply chute (8), Figs. 2 and 3, which receives the slaty coal, and of intermediate chutes (1 and 1), Figs. 1 and 2, where the picking is done; and third, of the delivery chute (10), Figs. 2 and 3, which carry off the coal picked over. The coal from the screen or jig, slides, as shown by the arrows, down the supply chute (8), on each side of which the intermediates, 1 and 1, are placed as close to each other as possible, there being room (14) enough between each two picking chutes for a man and a boy. At the other end of the intermediate is the delivery chute (10).

The supply and delivery chutes have the same inclination, but the former is a little the higher, so as to give a slight inclination to the intermediate, the axis of which is placed at an angle of about 8 to 10 degrees with the horizontal and 25 to 28 degrees with the supply chute. The slate-picker, who sits with his face toward the upper end of the chutes, causes a thin stream of coal to pass in front of him, cleaning it thoroughly as it passes. The same coal is handled by one man only, with this exception, that one or two men are placed at the end of the delivery chute to inspect the coal and take out any pieces of slate that may have escaped the regular pickers. Immediately over the supply-chute, and supported on iron rods, is the hell round slate-chute, into which the pickers throw their slate, slate coal, etc. This continues to the bottom, where it is examined, and the slate-coal is picked out and taken to the rolls to be broken up and prepared. This style of picking-chute is suited for broken, egg, stove and chestnut coal; for broken coal 1, Fig. 2, and for egg and stove coal 1, Fig. 1 are used. For steamboat coal an analogous form

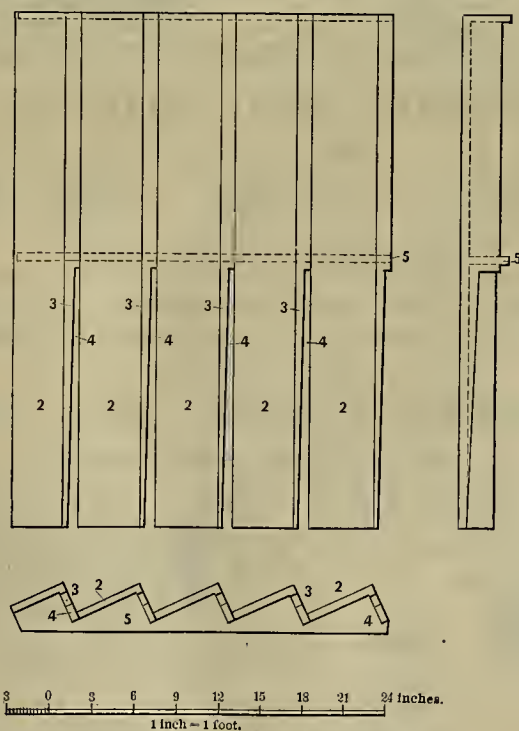


FIG. 4.—AUTOMATIC SLATE-PICKER.

is employed, the supply-chute being longer and the picking-chute larger, steeper and narrower, only one lump at a time coming down the chute. The automatic slate-picker, Fig. 4, depends

nothing to stop a piece from sliding through the slit.

This slate-picker is placed in an ordinary trough or chute, down which the coal slides. It receives pitch enough to allow the coal to slide over freely, but with not too great velocity. As the coal and slate come down the chutes, each lump places itself in one or other of the grooves or troughs, which are made a little wider than the largest lump of the size for which the picker is to be employed. As the lumps slide down, all the flatter pieces tend to pass out through the slit on the side, while the chisel lumps go over. Should a piece catch in the slit in consequence of the increase in height toward the end, some one of the pieces which follow will generally knock it loose, so that it does not remain and block the slit. This is an important point. The slits, if made parallel, would soon clog. The flat pieces, which are mostly slate, and which fall through the taper slit, pass over a chute or picking-table or any convenient place, where they are examined by a boy, who takes out any flat coal that may come through with the slate. With the larger coal, such as broken and egg, a great deal of what goes out is often coal and slate-coal, which is carefully picked out, the slate going in a chute to the slate-drag, which deposits it on the dirt bank. But the flat coal, slate-coal and honey (if valuable) are re-broken and are prepared with the other small coal that comes from the mines.

The rumor of another cave in the Utica mine at Angels Camp was incorrect. Mr. Laue, the superintendent, telegraphs that there is no cave and no probability of any. The mine was never more safe than now.

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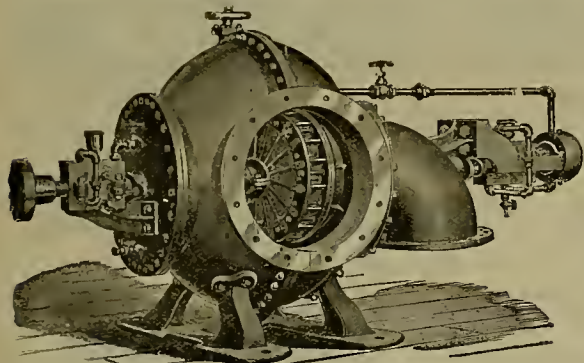
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paying gold mines in the world, and the end is not yet,
for these same mines are as rich to-day as at any time
during their history.

Gold mining, especially in Grass Valley, when under
honest and scientific management, is one of the safest
and most profitable of all American industries. It is a
business that will return annually a profit of from 100 to
300 per cent on the investment. Mining is a science
acquired only by years of study, combined with practical
experience. Therefore, failure is the rule whenever the
management is ignorant and unscientific.

The undersigned is a practical scientific and successful
miner, has made mining a life study and vocation, is
honest and trustworthy, and will not, under any circum-
stances, recommend or deal in any but valuable paying
property and properties that will develop dividend-
paying.

No Wildcat Mines; no Sharp Practices; no reasonable
chance for loss; Honesty and Square Dealing Guaranteed.
Correspondence solicited.

Full particulars by applying to

S. B. FOWLER, Supt. Hartley Mine,
Grass Valley, Nevada Co., California.

THE RUSSELL PROCESS.

For information concerning this process for the re-
duction of Ores containing precious metals, and terms
of license, apply to

THE RUSSELL PROCESS CO.,
Park City, Utah.

S. F. MARKET REPORT

Local Markets.

SAN FRANCISCO, July 16, 1891.

The change for the better in the weather noted last week has continued, greatly relieving the trade of the uneasy feeling caused by the extreme hot weather of about two weeks ago. Harvesting has progressed under the most favorable circumstances, and as the crops are much larger than in 1890 and the prices about 20 per cent more, it is claimed that for the next fiscal year there will be more general prosperity than ever before. The California wheat, barley and hay crops this year are estimated at about \$60,000,000. To this must be added other cereal crops, fruit, vegetables, etc., which will go well up toward \$100,000,000. Money is easy. The very large disbursements in this month are going into circulation and will soon be available for placing by bankers and others. At the East sterling exchange is easier and falling, this indicates that heavy exporting of produce is again setting in. It is the prevailing opinion in financial circles that Europe will soon begin to send gold to this country.

QUICKSILVER—Receipts the past week aggregate 253 flasks and exports by sea 263 flasks to Mexico. The market appears to have a steadier tone, although reports are still current of cutting in prices.

MEXICAN DOLLARS—The market is fairly steady at 80½¢@81¢. Some dealers are looking for better prices.

SILVER—The market has fluctuated, closing strong. Commencing soon there will be a largely increased demand in England, France and Germany for silver to pay for Asiatic imports, particularly those received from India. This demand, coupled with a free call from Spain, Portugal and one or more of the South American countries, ought to send the price to very nearly par by next December. The election contest in Ohio will be closely watched and the result looked forward to with deep interest, owing to free coinage of silver being an important plank in the Democratic platform, while the Republicans oppose it. The result of the election will have great weight in the next Congress on the subject.

BORAX—Receipts the past week aggregated 340 cts. and shipments by sea 645 cts. to New York. The market is steady, with a fairly firm tone.

LIME—Receipts the past week aggregated 4178 bbls. There is a fair export demand, while the home demand is steady.

TIN—Imports the past week aggregated 2445 pigs from Sydney and 4680 bxs plate by overland railroad. The market is dull and heavy. It is now being conceded that the outlook is not favorable to those large holders who bought expecting to unload at a good profit, after the tariff went into effect. It is quite likely that lower figures will obtain before the close of the year.

IRON—The market does not present any features deserving particular notice. In the East, the market is inanimate; the railroads have not bought more than one-quarter of the usual purchases of rail, while machinery men are also behind, the only class showing increased purchases is agricultural implement manufacturers.

LEAD—The market holds to steady prices. At the East, and also on this coast, there is a slightly creased consumption.

COPPER—The market is fairly steady. English cables report the market dull, but with the outlook favorable for a still larger consumption. At the East there is a steady increase in the stock of Lake, but a growing scarcity of cheaper grades. In New York very little, if any, Arizona ingot is on sale. The bulk of the product of the mines is under contract and it is stated that Pig copper would bring 12c, on dock, to-day. Casting brands at less than 12c are not readily obtained as smelters still experience difficulty in securing furnace material at a cost relatively lower than 12½¢ for ingot.

COAL—Imports the past week aggregated as follows: Comox, tons, 4300; Coos Bay, 450; Departure Bay, 2416; Nanaimo, 6278; Sydney, 5504; Liverpool, 2252; Newcastle, N. S. W., 1864. Total, 23,064 tons. Imports the past week were free, while the demand was barely steady. The coast output is expected to increase from now on. From Australasia our advices indicate that more tonnage is offering for August-September loading. The quantity of Australian coals on the way to Southern ports and to San Francisco is represented in the following registered tons of ships reported: San Diego, 10,900; San Pedro, 4675; San Francisco, 46,417. Total, registered tons, 61,992, equal to a carrying capacity of nearly 100,000 tons.

Eastern Metal Markets.

By Telegraph.

New York, July 16.—The following are the closing prices the past week:

	Lead.	Tin.
Thursday	100 3/4	13 1/2
Friday	100 3/4	13 1/2
Saturday	100 3/4	13 1/2
Sunday	100 3/4	13 1/2
Monday	100 3/4	13 1/2
Tuesday	100 3/4	13 1/2
Wednesday	100 3/4	13 1/2

The large output of copper by the Lake mines is against the copper market, yet European advices report gradually depleting stocks. Tin is easy at a decline. Lead is steady, as is borax. Quicksilver is Steadier.

Coal and Coke.

SPOT FROM YARD—PER TON.	TO LOAD—PER TON.
Wellington	\$ 9 00 Australian
Greta	8 50 Liverpool Stm.
Carlton Hill	8 00 Scotch Splint.
Nansamoo	9 00 Cardiff
Gilman	7 50 Lehigh Lump.
Seattle	7 50 Cumberland h.k.
Cocoa Bay	6 00 Egg, hard.
Cannel	9 50 West Hartley.
Egg, hard	14 00
Cumberland, in sacks	14 00
do, bulk	13 00
Wallaend	9 00
Scotch Splint.	8 50
Wymbo	8 50
West Hartley	8 50

Coke—English.

To load, \$12 00@18 00
Spot, in bulk, 14 00@16 00

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ'T AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Best & Belcher M. Co., Nevada.	30. 500. June 23, July 23, Aug 18.	L Osborn.	309 Montgomery St
Chollar M. Co., Nevada.	30. 500. June 23, July 23, Aug 18.	C E Elliott.	309 Montgomery St
Cosmopolitan M. Co., Nevada.	30. 500. June 23, July 23, Aug 18.	A W Barrows.	309 Montgomery St
Crown Point M. Co., Nevada.	55. 500. July 9, Aug 13, Sept 3.	J Newland.	331 Pine St
Evening Star M. Co., California.	1. 500. June 25, July 23, Aug 20.	J Scoville.	320 Sansome St
Golden Jacket M. Co., Nevada.	1. 500. June 25, July 23, Aug 20.	R G McCallan.	331 Montgomery St
Gray Eagle M. Co., California.	30. 500. July 14, Aug 4.	F E Luty.	303 California St
Inyo Marble Co., Nevada.	13. 500. May 26, July 10, July 28.	G W Luce.	132 California St
Justice M. Co., Nevada.	48. 250. July 11, Aug 15, Sept 4.	R E Kelley.	419 California St
Mammoth Springs M. Co., California.	20. 500. June 1, July 6, July 27.	R F Mott.	Forest City
Mineral King M. Co., Arizona.	30. 500. June 24, Aug 1, Aug 25.	J T Norman.	419 California St
Northwestern L. & M. Co., Br. Columbia.	3. 80. June 13, July 31, Aug 24.	F Bonacina.	438 California St
Peer M. Co., Arizona.	10. 500. May 23, July 3, July 23.	N T Messer.	309 Montgomery St
Piedmont M. Co., Nevada.	2. 500. May 21, June 30, July 22.	J Scoville.	320 Sansome St
Saratoga M. Co., Nevada.	1. 500. June 20, July 24, Aug 12.	W T Drake.	109 California St
Sey Belcher & Mides Cons M. Co., Nev.	8. 250. June 18, July 20, Aug 10.	E H Holmes.	309 Montgomery St
Silver King M. Co., Arizona.	6. 200. May 20, June 23, July 28.	J W Pew.	310 Pine St
Telegraph Drift M. Co., California.	4. 6 mills. June 1, July 8, July 29.	F R Wehe.	Dowdville
Teirakoff Cons M. Co., California.	6. 100. June 11, Aug 11, Sept 5.	W J Gurnett.	308 Pine St
Teresa M. Co., Mexico.	4. 100. June 8, July 10, Aug 12.	A Cheminant.	328 Montgomery St
Valley View M. Co., California.	3. 500. June 18, July 20, Aug 12.	W J Gurnett.	308 Pine St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Benton Cons M. Co., California.	T V Belcher.	319 Pine St.	Annual.	July 25
Debie Blue Gravel Co., California.	T Wetzel.	320 Sansome St.	Annual.	Aug 4
Lady Washington M. Co., Nevada.	L Osborn.	309 Montgomery St.	Annual.	July 29
McMullen M. Co., Nevada.	J P Overton.	328 Montgomery St.	Annual.	Aug 5
Moulin Tumbler Gravel Co., Cal.	E G Ladd.	219 Sansome St.	Annual.	July 17
New York M. Co., Nevada.	C E Elliott.	309 Montgomery St.	Annual.	Aug 1
Union Cons M. Co., Nevada.	A W Barrows.	303 California St.	Annual.	July 40
Yellow Jacket M. Co., Nevada.	W H Blauvelt.	Gold Hill.	Annual.	July 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M. Co., Nevada.	T Wetzel.	320 Sansome St.	10.	July 15
North Banner Cons M. Co., California.	T J Mitchell.	Grass Valley.	50.	Apr 20
North Commonwealth M. Co., Nevada.	J W Pew.	310 Pine St.	25.	June 17
North Star M. Co., California.	D A Jennings.	401 California St.	50.	Apr 8
Pacific Coast Borax Co., California.	A H Clough.	230 Montgomery St.	1 00.	July 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 25.	WEEK ENDING July 2.	WEEK ENDING July 9.	WEEK ENDING July 16.
Alpha	65	85	60	70
Alca	60	75	65	70
Andes	100	125	115	130
Belcher	135	185	125	155
Belle Isle	80	95	75	90
Best & Belcher	215	305	210	230
Bullion	200	220	230	250
Bodie	75	90	75	90
Bulwer	40	45	55	50
Commonwealth	65	70	60	70
Con. Va. & Cal.	600	755	587	600
Challenger	105	125	110	125
Chollar	150	250	160	170
Confidence	375	400	370	380
Con. Imperial	15	10	15	10
Caledonia	130	175	125	140
Crown Point	130	175	125	140
Crocker	10	10	15	10
Del Monte	15	15	15	10
Eureka Cons.	350	420	325	350
Eschschuer	10	60	50	50
Grand Prize	15	10	10	10
Gould & Curry	125	180	125	150
Hale & Norcross	130	200	160	170
Justice	15	10	15	10
Kentuck	30	35	30	30
Lady Wash	20	15	20	25
Mono	35	50	45	50
Meislen	205	260	200	215
Narajo	25	30	25	30
North Belle Isle	55	70	45	55
Nev. Queen	25	30	25	30
Occidental	125	150	115	130
Overman	300	450	300	350
Potosi	195	250	220	210
Peerless	350	415	330	350
Peer	10	15	10	10
Savage	150	190	170	180
S. B. & M.	50	75	55	60
Sierra Nevada	180	225	170	200
Silver Hill	20	25	15	20
Scorpion	190	230	210	220
Union Cons.	65	80	70	85
Yellow Jacket	165	220	155	170

San Francisco Metal Market.

WHOLESALE.	THURSDAY, July 16, 1891.
ANTIMONY	— @ 15 1/2
BORAX—Refined, in carload lots	8 1/2 @
Powdered	8 1/2 @
Concentrated	7 1/2 @
All grades jobbing at an advance.	
COPPER—	
Roll	22 @
Sheeting	22 @
Ingot, jobbing	22 @
do, wholesale	21 1/2 @
Fire Box Sheets	22 @
LEAD—Pig	4 1/2 @
Sheet	4 1/2 @
Pipe	6 1/2 @
Shot, discount 10% on 500 bags	1 50 @
Shot, bag	2 00 @
Chilled, do.	2 00 @
QUICKSILVER—By the flask.	41 50 @
Flasks, old	40 @
CHROME IRON ORE, 1/2 ton	10 00 @
IRON—Bar, base	24 @
Norway, base	24 @
STEEL—English, lb.	16 @
Cast iron tool	9 @
Black Diamond tool	9 @
Pick and Hammer	8 @
Machinery	4 @
Toe Calk	4 @
TINPLATE—B. V., steel grade, 14x20, spot.	6 50 @
do, roofing, 14x20	6 00 @
do, do, 20x28	13 00 @
Pig tin, spot, 1/2 lb., irregular, nominal.	21 @
IRON—Glenarock ton	30 @
Eglington, ton	29 00 @
American Soft, No. 1, ton	28 00 @
Oregon Pig, ton	30 00 @
Puget Sound	30 00 @
Clay Lane White	26 00 @
Shotts, No. 1	30 00 @
Langdon	28 00 @
Thorcliffe	29 00 @
Charlottesville	24 00 @
Barrow	29 00 @
Cargoeft	25 00 @

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINES and Stock in Mines for sale. See advertisement on page 45.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California. Notice—There are delinquent upon the following described stock, on account of Assessment (No. 24) levied on the Ninth (9th) day of June, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amount.
Barrows, A. W., Trustee	553	500	\$15 00
" " "	565	271	8 13
" " "	562	500	15 00
" " "	563	500	15 00
" " "	568	1,000	30 00
" " "	569	1,000	30 00
" " "	578	500	15 00
" " "	597	1,000	30 00
" " "	598	500	15 00
" " "	599	500	15 00
Boesher & Co., J.	551	40	1 20
Bogart, O. H., Trustee	425	100	3 00
" " "	426	600	18 00
" " "	442	500	5 00
" " "	443	20	60
" " "	488	105	3 15
Nash, H. W.	269	104	3 12
Stout, C. S., Trustee	476	2,000	60 00
" " "	477	953	28 59
Stout, Mrs. M. E.	170	500	15 00
" " "	188	500	15 00
Seasles, W. A., Trustee	618	1,000	30 00
Wetzel, Theo., Trustee	301	50	1 50

And in accordance with law, and an order of the Board of Directors, made on the Ninth (9th) day of June, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 308 California street, San Francisco, California, on TUESDAY, the Fourth (4th) day of August, 1891, at the hour of one o'clock P. M. of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary.
Office, Room 11, No. 308 California street, San Francisco, California.

MINING AND Ore Dressing Machinery.

By C. G. WAMFORD LOCK.
CONTENTS—Motive Power—Transmission of Power. Quarrying—Prospecting, Shaft-sinking, Coal-cutting, Pumping, and Ventilating Machinery—Lighting—Hauling and Hoisting Transport—Reducing—Dressing—Miscellaneous.
Price \$21.00. Circulars and Catalogues on application.

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Ships under advances to smelting works in Boston New York, Baltimore and Liverpool.
Twenty-one years' experience in Shipping Ores and Managing Mines.
Solicits Consignment of Copper Produce and Management of Mining Matters.
All business conducted on Cash Basis.
Purchases and shipment of Mining Supplies a SPECIALTY.
Sales of Developed Copper Mines undertaken.
Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

ATTENTION.

NOTICE IS HEREBY GIVEN THAT ANY PARTIES infringing patents granted me by the United States on Air Compressors and Rock Drills, by manufacturing, using or selling the same, will be prosecuted to the full extent of the law.
CHAS. CUMMINGS,
411 Mission St., San Francisco.

The German Savings and Loan Society,

526 California Street.

DIVIDEND NOTICE.

For the half-year ending June 30, 1891, a dividend has been declared at the rate of five and four-tenths (5 4/10) per cent per annum on term deposits, and four and one-half (4 1/2) per cent per annum on ordinary deposits, payable on and after Wednesday, July 1, 1891.
GEO. TOURNEY, Secretary.

Practical Mining Expert.

HAVING ASSOCIATED MYSELF WITH MINING FOR the last 35 years, including three years through five of the principal mining States of old Mexico, I am now prepared to examine and report on formation, together with the permanency, as well as the character of the vein, whether gold, silver, copper, lead or tin. Address JOHN C. COX, Santa Rosa, Sonoma County, Cal.

MORE ATTENTION.

NOTICE IS HEREBY GIVEN THAT ALL PATENTS and inventions of Charles Cummings for Compressed Air Rock Drills and Air Compressors are the property of The Cummings Rock Drill Company, by contracts and assignment from Charles Cummings, duly recorded in the U. S. Patent Office, and any infringement thereof will be prosecuted by THE CUMMINGS ROCK DRILL CO., 59 and 61 First Street, San Francisco, Cal.

BLOWING ENGINE FOR SALE.

Vertical pattern, with balanced steam slide valve gear, steam cylinder 14 in. diameter, air cylinder 40 in. diameter, stroke 24 in. 1 to 100 strokes per minute; engine new. For price and particulars JAMES LEFFEL & CO., Springfield, Ohio.

SITUATION WANTED.

By a man 42 years old, with 7 years experience in gold, silver and opal mining and surveying; graduate of the Mining Academy in Schemnitz, Hungary. References in Hungarian (Magyar) language. Content with moderate salary until he proves his ability. Address FREELAND, P. A., Lock Box 52, G. S.

PIPE WORK AND LAYING OF ANY KIND.

New way of joining all joints better than old lead joint in any work of work. Special attention to mines, and all work appertaining to laying of pipe done with dispatch. GEO. W. CRAWLEY, 908 Shotwell St., San Francisco.

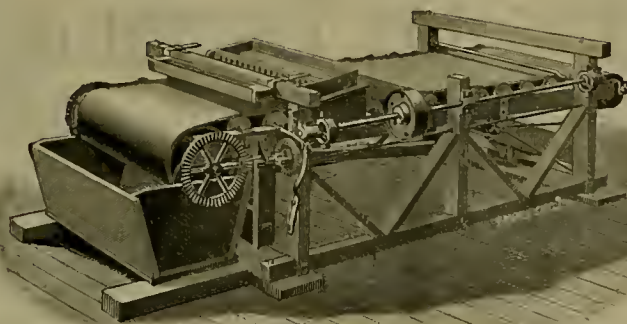
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TULLOCK IMPROVED ORE CONCENTRATOR.

Patented Oct. 8, 1889, and Dec., 1890.

ANGELS, CALAVERAS COUNTY, NOV. 22, 1890.
 JAMES TULLOCK, Esq. Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, adaptable in construction of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
 WOODSON GARRARD,
 Supt. Gold Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENTS
 OFFICE, GIBBONSVILLE, IDAHO, O. T. 6, 1890.
 MR. JAMES TULLOCK, Angels, Cal. Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about it. A "letter of instruction" until they were set up and running, and you recalled to my mind your letter and instructions. Yours truly,
 MYRON K. RODGERS, Supt.



ANGELS, CALAVERAS CO., NOV. 22, 1890.
 JAMES TULLOCK, Esq. Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, 100 ton stamps, for over six months last past, and I heroby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours,
 T. M. LANE, Supt. Madison Mine.

Price, \$450.

FOR FURTHER PARTICULARS, ADDRESS

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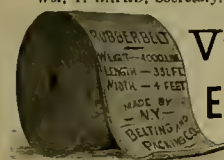
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For prospecting Mineral Veins and Deposits, Boring Vertically, Horizontally, or at any angle to any desired depth, taking out a Cylindrical Section or Core the entire distance, showing exact character, and giving a perfect section of the strata penetrated. Also for Boring Artesian Wells perfectly straight, round and true.

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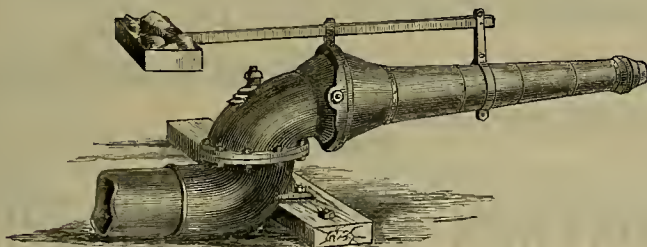
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Adamantine Shoes and Dies AND CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

THESE CASTINGS ARE EXTENSIVELY USED IN ALL THE MINING STATES and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

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Special attention given to the purchase of Mine and Mill Supplies.

Stamp Cam.

Declaration of Levy Brown on Spiritualism.

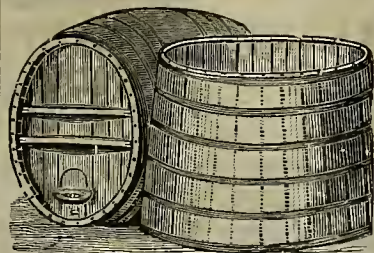
SPANISH CAMP, June 16, 1891.

Mr. Bagen came to my place in 1887 and brought with him two men who desired to examine two quartz ledges, which they wished to prospect and, if satisfactory, to purchase the same. One of them liked the ledge on the east side of Big Canyon and was anxious to buy, but said his money was East. He wrote for the money, but failed to get it until his bond expired. After they left I felt fatigued, and laid down to rest and fell asleep. Woke up soon. When I got on my feet I heard the noise of a quartz mill. The stamps struck one, two, three. After that there was a general roar from the stamps. Ran one or two minutes and then struck three, two, one. In about two minutes I heard three distinct whistles from an engine. I wish to sell this ledge and all the land east of the canyon, about 15 or 18 acres. I also wish to sell my ranch west of canyon containing about 140 acres, about 9000 bearing vines and 50 fruit trees of different varieties; also berries of different kinds. House, out-building, with cellar well filled with wine, with all implements necessary to care for the wine. Terms, half cash, the balance on time, with seven per cent interest per annum.

LEVY B. BROWN.

Mark.

Subscribed and sworn to before me this 16th day of June, 1891.
 JOHN MCCARTY, Notary Public.



WATER TANKS, WINE TANKS!
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FULDA BROS., Proprietors,

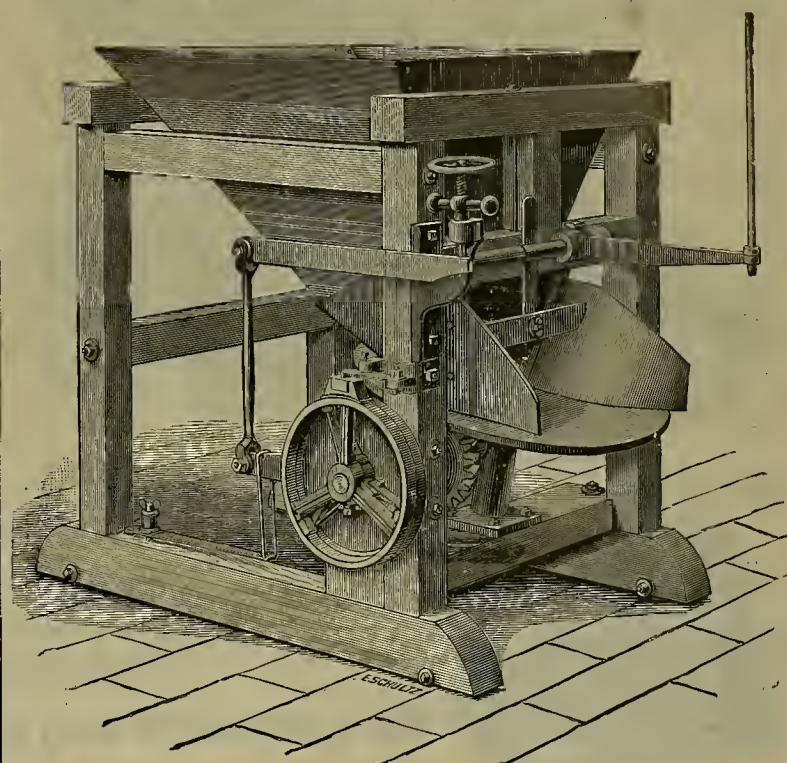
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ALL KINDS OF CASKS, TANKS, Etc.

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"HENDY" IMPROVED "CHALLENGE" ORE FEEDER.

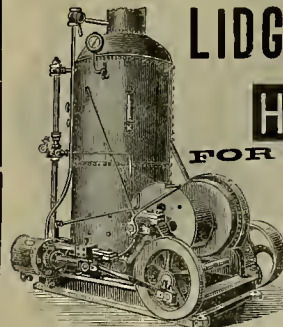
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And pronounced by reputable mining men to be far superior to any other, as the fact that over 8000 have been placed in successful operation fully demonstrates.

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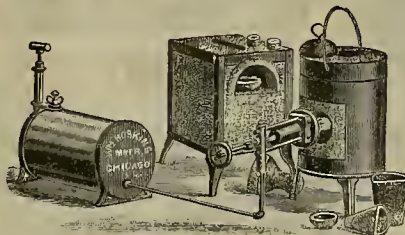
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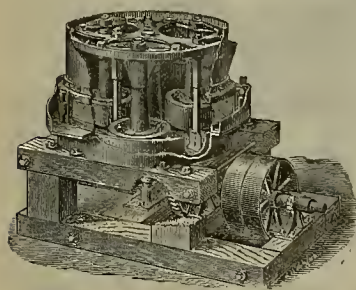
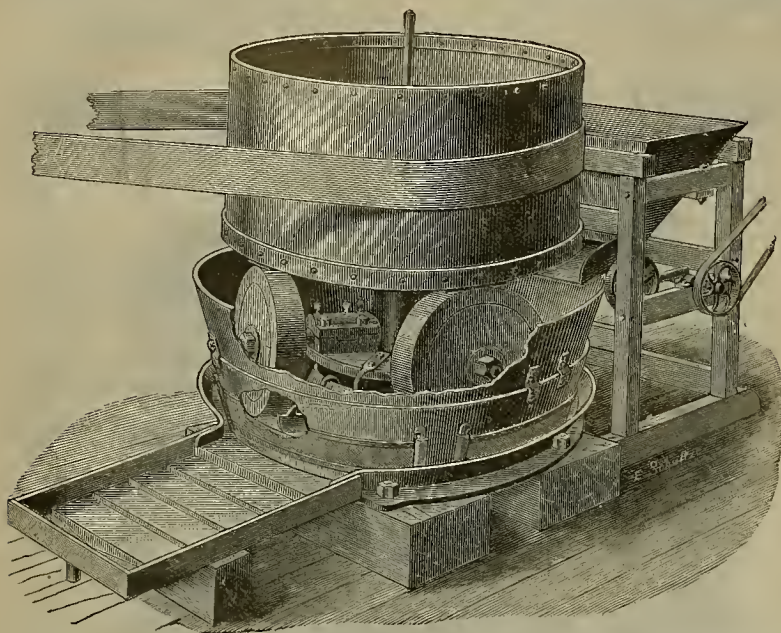
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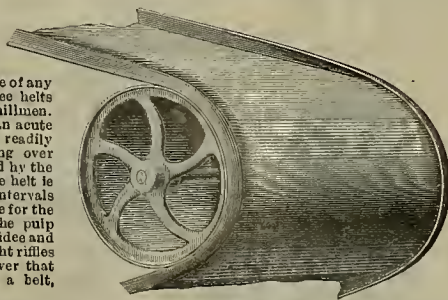
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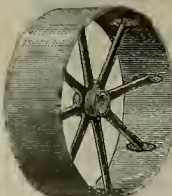
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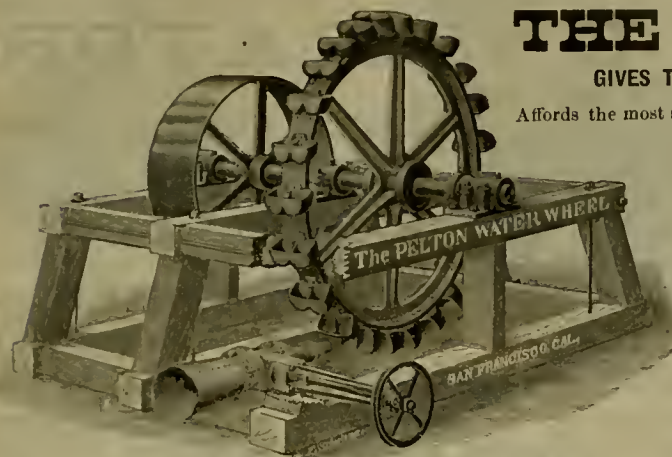
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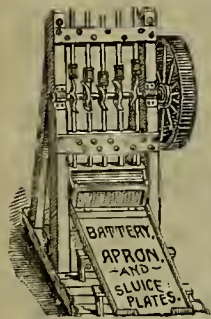
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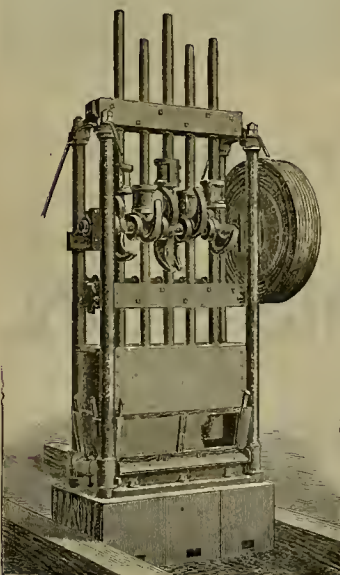
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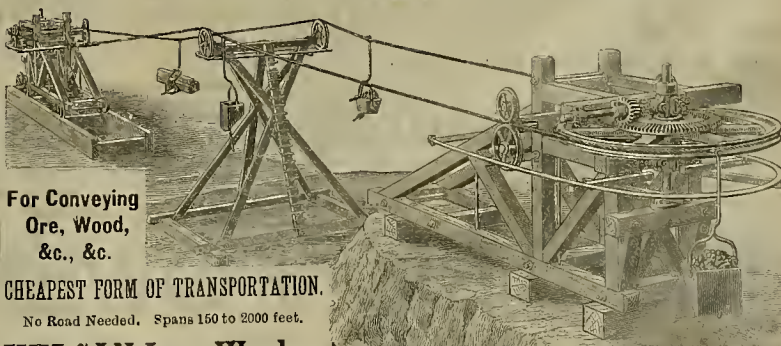
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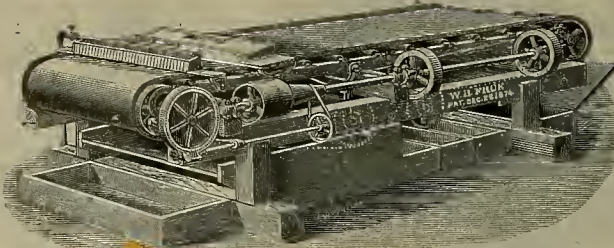
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

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The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



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Patents applied for.

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PARKE & LACY COMPANY,

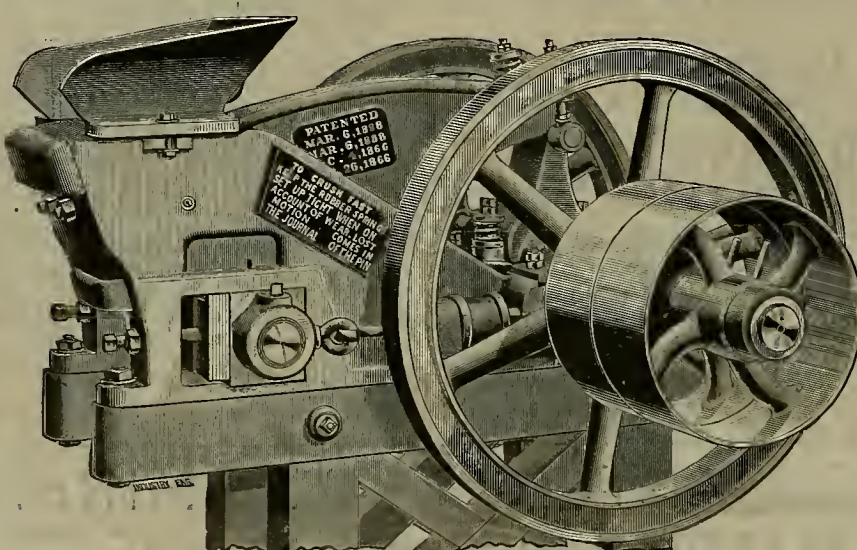
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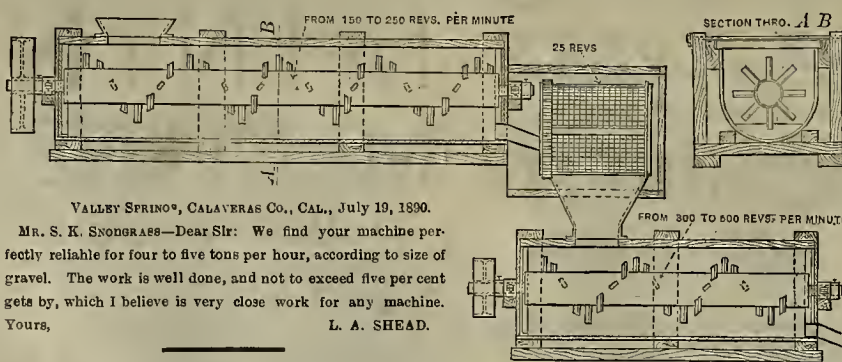
21 and 23 Fremont St., San Francisco, Cal. 187 and 189 Clarence St., Sydney, N. S. W.

COMMON SENSE PULVERIZER AND CONCENTRATOR.

This is the most successful machine yet discovered for working Gravel, Cement, Clay, etc. It avoids crushing the rocks which are washed clean and at the same time pulverizes the Cement or Clay and SAVES EVEN FLOUR GOLD.

It is only necessary to have about six inches of water to work 100 tons or over per day.

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VALLEY SPRING, CALAVERAS CO., CAL., July 19, 1890.

Mr. S. K. SNODGRASS—Dear Sir: We find your machine perfectly reliable for four to five tons per hour, according to size of gravel. The work is well done, and not to exceed five per cent gets by, which I believe is very close work for any machine.

Yours,

L. A. SHEAR.

SAN FRANCISCO, March 25, 1891.
S. K. SNODGRASS, Esq.—Dear Sir: In regard to the work done by your machine, which we have had in operation for the past three months, I can say that it has handled successfully all material as taken out of our ground, the only cement which was not perfectly broken up being an exceedingly hard cemented material approaching rock in its hardness.

For all free wash and moderately hard cement it will do very good work, and must effect a great saving in working such gravels and cements, owing to the small head of water required; and furthermore, its great gold-saving qualities, as I am satisfied that fully 95 to 98 per cent of the gold freed in the machine is saved, even to flour gold, and that too without the use of quicksilver.

The automatic rejection of all rocks and material by the revolving screen makes the handling of the gravel cheaper, as all hand culling of the material is rendered unnecessary. Truly yours,

W. W. B. STEVENS.

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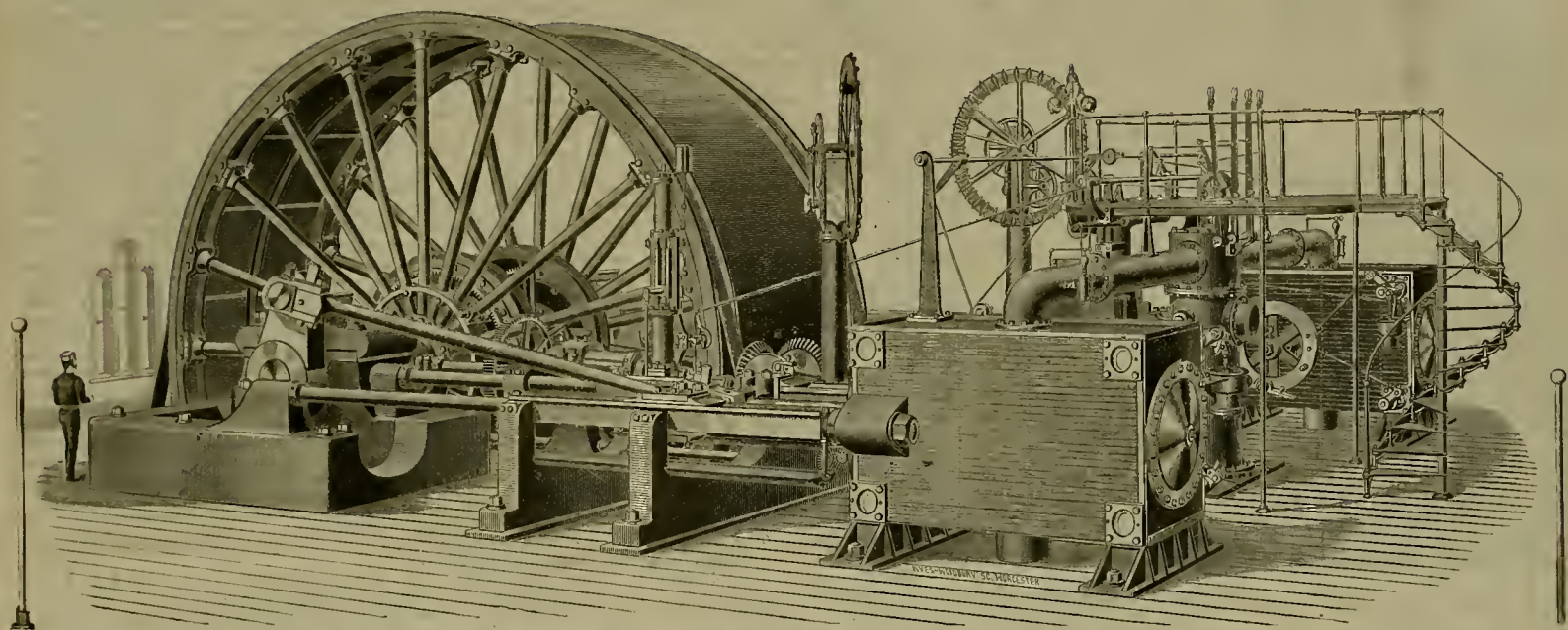
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 4.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, JULY 25, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.



HOISTING ENGINES BUILT FOR THE TAMARACK MINING CO. OPEOHEE, MICHIGAN—See page 56.

Regenerative Coke Ovens.

In proportion to the amount of by-products by condensation from the gases of coking is the inducement to include in plants and practice the saving of such by-products. It has been found that, as in gas distillations, so in the condensation of coke-oven gases, the proper regulation of temperature and pressure permits the formation of a whole series of useful by-products. This system is now employed in ever increasing extent, particularly in Upper Silesia. In a paper read at the Pittsburgh meeting of the American Institute of Mining Engineers, Dr. Herman Wedding of Berlin,

Germany, one of the visiting German iron masters, described condensing works and the ovens.

The ovens shown in the cuts have each a capacity of 5.75 metric tons of dry coal and the coking requires 48 hours. The practice had been introduced at one time, of providing regenerative (see cuts) to be heated by the burned gases (after these, by their combustion, had heated the coke-oven), and to heat or burn the freshly entering gases and the air for their combustion. But it has been demonstrated by the experiments of the well-known constructor of coke-ovens, Dr. Otto of Dahlhausen, that this preheating of the gases may be well

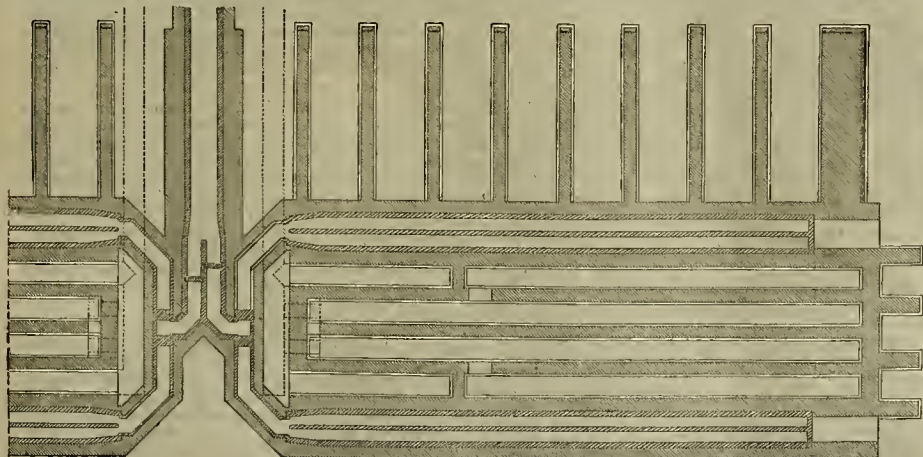
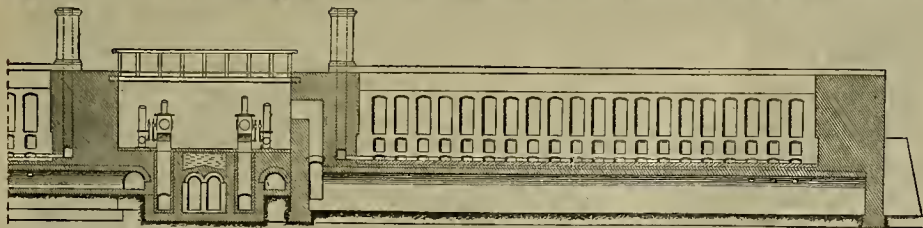
omitted, if the air is sufficiently heated. The resulting oven construction is shown in the other cuts. We shall, next week, describe the condensing apparatus.

Coast Iron.

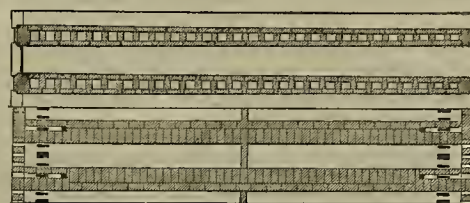
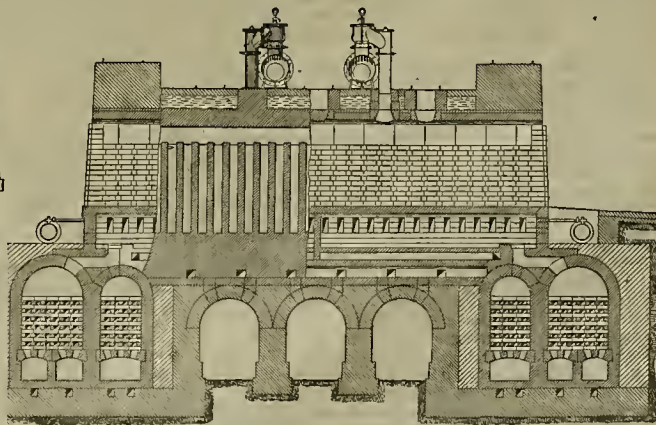
An article of interest on this subject is given on page 51 of this number of the PRESS. Mr. Weeks, the author, who recently visited this coast, recognizes the fact that while we have plenty of iron, our fuel is not plentiful, and expresses the opinion that our future iron and steel industry will be on Puget Sound, though costs at present are excessive. He thinks that

in California it is out of the question to make pig iron from native ore with anything but charcoal, and that good foreign pig could be bought cheaper than iron made that way in this State.

It is true that the California coals are poor, but there is an abundance on the northern coast and immense quantities come by sea from abroad. Pittsburgh, where Mr. Weeks resides, has no iron of her own, bringing it 1500 miles by rail, yet that city leads in the iron business of this country. We have an abundance of iron ore of specially good quality at various points in California. So it is not beyond the possibility of bringing coal to the iron.



SECTION AND PLAN OF A DOUBLE-BENCH OF COKE OVENS WITH CONDENSERS.



REGENERATIVE COKE-OVENS AT PLUTO MINE.

Mining by Tunnel.

From the first discovery of mineral by the California volunteers, in the early days up to the present time, the business of mining in Mojave county, Arizona, has been carried on under greater disadvantages, perhaps, than in any other portion of the west.

Separated from their base of supplies by hundreds of miles of desert sand, and living in a country where it was impossible to produce anything for their own sustenance, the miners and prospectors of Wallapai district had an apparently hopeless task before them when they commenced the work of exploring and developing the ledges of the Cerbat range, with a view to attracting capital and immigration. Had the surface ores not been of exceptional richness, the country must have been abandoned to the coyotes and Wallapai Indians, but with a determined perseverance, characteristic of the pioneers, they dug and delved, at times poorly clad and half-starved, but never discouraged, awaiting the coming of the day which would bring them the expected reward for all their trials and privations.

The result of their labors may now be seen, after the lapse of nearly a generation, in the hundreds of old dumps and prospect holes, shafts and stopes filled with water, and caved-in, old tumble-down cabins and a few, a very few of the old-timers, bent and grey, but with a steadfast faith in the future of the district, which years of patient endurance have only intensified.

Any one acquainted with the history of mining in Mojave county cannot but be impressed with the belief that her capabilities and mineral resources are worthy of better things. Many of the old shafts now filled with water and abandoned, have produced thousands of dollars, and only need capital to make them once more producers of the precious metals.

The rich surface ores have been worked out years ago, and future dividends must be obtained from below water level by other appliances than a windlass and rawhide bucket. In looking over the mining districts of Mojave county as one knowing from experience its wealth and capabilities, we have been greatly impressed with the possibilities which would result in the development of her mines, could the mountain ranges be pierced by tunnels, as is the case in other mining States and Territories. So far as our knowledge extends, there is not a single prospecting tunnel in the county, yet there are more localities favorable for such undertakings where tunnels for the working and draining of mines could be made to pay a handsome interest on the investment, and at the same time settle the question so often asked by skeptics and croakers, "do the mines go down?"

A year or two ago we had occasion to make a survey of a tunnel site for parties who contemplated organizing a company to drive a tunnel under Stockton Hill. As the company never materialized we will betray no confidence by giving a few facts and figures which may possibly be of interest to the public.

The site selected was at the eastern base of the Cerbat range, at a point near the Cupel wash, and the line of the projected tunnel passed over Stockton Hill crossing at nearly right angles the Cupel, Tiger, Tigress, Prince George, Infatigable and other well known veins. It was found that the Cupel would be cut at a depth of about 800 feet, and the summit of the Cerbat range would be nearly 1200 feet above the tunnel level.

The total length of a tunnel at this point would be a little less than four miles and in this distance more than a hundred ledges would be out which show surface croppings, beside blind ledges covered by debris yet undiscovered.

In order to carry on an undertaking of such magnitude it would be necessary to erect at the eastern end, machinery for driving air compressors, power drills, machine shop for repairs, etc.

At the mouth of Cupel wash there is a beautiful situation for a town, where mills and reduction works could be built for the reduction of ores extracted from ledges out by the tunnel, and water could be obtained by the drainage of the mineral belt sufficient to irrigate thousands of acres of land in the Wallapai valley transforming the grassy plain into gardens, vineyards and orange groves.

Colorado is a State noted for its tunnel enterprises and the writer recalls the "tunnel boom" which swept over the Territory more than 20 years ago, when every mountain side was covered with tunnel sites and every man owned at least a dozen locations. The greater portion of these never passed beyond the first stage of development—a big sign and two sets of timber—but many were driven thousands of feet into the mountains and these same tunnels are to day the main mining enterprises of many localities, and dividend-paying propositions. What has been done in Colorado can be done here in Mohave county. We have mines equally as rich, and incomparable climate and a soil of unsurpassed fertility, it only remains for enterprise and capital to join hands and push the undertaking to a successful termination. Until our mines are worked intelligently and on business principles we cannot expect to be blessed by that material advancement and prosperity which has built up the mining interests of other States and Territories to the proud positions they now occupy as producers of the precious metals.—*Cor. Mohave (A. T.) Miner.*

The New Montgomery District.

George Montgomery, the locator of the mining district which bears his name, on the verge of Death Valley, and the discoverer of what is supposed to be the celebrated Breyfogle mine, has arrived in town direct from the camp. He is accompanied by E. A. Shattuck, the Recorder of the new district, and Mr. Davis, who is interested in some of the more prominent mines.

Mr. Montgomery was in high spirits over some recent mineral discoveries in the vicinity of the Chispa, as his own mine, the first location made in the district, is named, when a Post reporter dropped in at his room. "Everything is doing well down with us," he said, "and much better than any of the members of the original prospecting party could have hoped for. Later arrivals are well pleased with the prospects, and very few have visited the district without either camping there overnight or coming back again as soon as possible.

"The mines on which work is being done are opening up well. The shaft on the Chispa has been sunk 45 feet in the vein, and the ore samples show well all the way down, recent assays from the bottom of the shaft running all the way from \$27 to \$394 to the ton. The hanging wall has not yet been out, but a cross-cut was recently run in to the foot-wall, which was discovered to consist of shale. The other wall is thought to be quartzite, as it appears on the surface croppings.

"The rock is very easy to work, and breaks very fine in bottom of shaft. The new mill is being erected about four miles from the mine, the road being over a grade which rises 1500 feet in three miles. Steam power will be used, plenty of wood being obtainable at \$6.50 per cord. No ore has been crushed as yet, but reserves are accumulating all the time, as all the rock taken out of the seven-foot shaft is pay.

"The Mammoth mine is considered the next in importance, the showing as work progresses being particularly favorable. The shaft at the Yount mine is down 50 feet and the vein at the lowest point is from three to four feet wide. Samples from this property taken by Mr. Hanchette, who was formerly one of the owners of the State Line mine of Nevada, ran over \$800. The high assays led him to believe that the claim had been salted for his benefit, and led him to make the closest possible investigation to confirm the first results. He was rather surprised to find, after spending some time on the property, that his original assays were lower than any obtained in the subsequent critical tests.

"On the 4th of July a new discovery was made by three prospectors close to the main ledge of the district. The ore is a galena, rich in silver and carrying gold. Assays made of samples brought into camp run from \$25 to \$100 in gold and 500 ounces of silver to the ton. The new ledge can be traced for a considerable distance, and it has all been taken up. The varied character of the ores in the district has been a source of great surprise to the mining men who have penetrated the district. Sometimes it is the regular ribbon quartz showing free gold, and again the quartz is stained with iron and copper. The copper stained rock is always found to be rich in gold, and samples pounded in a hand mortar will average over \$1 in gold to the pound. Great boulders are found as float on some of the principal locations literally spattered with gold, and in some places croppings of the same character stand boldly up above the surface for the entire length of a claim.

"The ore veins of the district are turning out much better than expected, widening out and becoming well defined as depth is attained. Only one sale has so far been made in the camp, and that was one out of twelve locations made by a prospector from Modesto. He sold the claim for \$15,000 to some men from Eureka, Nev. As a rule the people who have located on mines are not on the market. They believe in the future of the camp and are satisfied that there is more money to be made in working the ores.

"The district is developing wonderfully. There are now over 60 people residing there, and freighting from Daggett is active. Two stores have been opened, and they are well stocked with everything necessary in a mining camp. The future of the camp is now well assured, and the best proof of the value of the mines is that the miners there, all of whom have been connected with the bonanza camps of Nevada and the West generally, speak in the highest possible terms of the ore development."

CONSOLIDATED VIRGINIA DIVIDENDS.—The Directors of the Con. Cal. and Virginia Mining Company have declared a dividend (No. 35) of 50 cents per share, aggregating \$108,000. The last dividend declared was on April 10, 1890, of 25 cents. The total amount disbursed in dividends by the Con. Cal. and Virginia up to date foots up \$3,462,000. Opinion is divided among local operators as to the continuance of the dividends, but the general opinion is that before the ice forms in the Carson river, Con. Cal. and Virginia will have paid six dividends this year, two or three of which may be 25-cent dividends. The prospects of the mine are really good for the payment of six 50-cent dividends. The ore in sight would seem to warrant this statement. In the neighborhood of the 1700 and 1750 levels a very good body of ore is being opened out. The 1600 and 1500

levels, and the stopes above them, are yielding well, and no work whatever has been done above the 1100 level and north of the point where they are at present stopping out ore. The immediate future of the mine and its best prospects are in this direction. This includes the territory from the south line to the north end, beginning at the 1300 level, clear to the croppings, which lie on the side of the hill far to the west. Steam will not be shut off until this big block of rich mineral-bearing ground is cut up into 50-foot cubes.—*Virginia Enter.*

Production of Lead.

The Rocky mountain region is the great lead-producing area of the United States, and Colorado is far ahead of the other States. The cost of smelting has been greatly lowered, having apparently been in 1889 \$6.97 per ton of material treated, without allowance, however, for loss of base or precious metals. A census bulletin on the subject says: "The most striking fact illustrative of the great progress made in lead-smelting is the enormous quantity of ore treated when compared with the relatively small amount of lead produced—in other words, the small quantity of the base metal in the furnace mixture. It proves what progress has been made in smelting. Where it is possible to add to what may be termed lead ore proper such quantities of strictly argentiferous or dry ore, the average percentage of lead in the mixtures was between 11 and 11.5. The exact amount cannot be stated in the absence of any data on the silver contents of the base bullion. A decade since, such results would have been unattainable without heavy losses, both in the base and precious metals."

Special interest is attached to the operations of smelting establishments near the Mexican border in Texas and New Mexico. One of them, however, did not begin operations until the close of the census year. The number of establishments was three, and the product of bullion was 13,733 short tons, and the quantity of ore treated was 79,168 short tons.

The product of the great lead-producing regions in the census year is given as follows:

State.	Tons.	Amount.
Arizona.....	3,158	\$98,747 84
California.....	53	1,999 65
Colorado.....	70,788	2,101,014 31
Idaho.....	23,172	1,042,629 31
Montana.....	10,183	456,975 40
Nevada.....	1,094	72,653 64
New Mexico.....	4,764	170,754 59
South Dakota.....	116	4,653 44
Utah.....	16,675	763,329 09
Total.....	130,903	\$4,712,767 27

The State of Missouri, during the same time, produced 44,482 tons. The lead production of Colorado, and its value during the census year, was very heavy. The most productive of the counties was Lake, with 100,953,862 pounds, valued at \$1,448,643; Pitkin county follows with 14,263,832 pounds, and Chaffee county with 3,078,247 pounds.

One group of smelters, says the bulletin, the operators of which it is possible to segregate without risk of obscuring the results by the introduction of figures, which should be assigned to allied branches of the industry, are the Colorado smelters, the aggregate embracing the reports from nine plants, the product of base bullion being 67,867 short tons, and the quantity of ore treated 602,014 short tons. It is shown that there are 1929 employees in the lead smelters in Colorado, of which 1818 are laborers, 62 mechanics, 47 foremen and 2 boys. The laborers on an average receive \$2.52 per day, the mechanics \$3.57, and the foremen \$4.17. The total disbursements, exclusive of the value of ore, is stated to be \$4,196,405.10, as follows: Total wages, \$1,645,819.46; salaries, \$206,606.81; paid contractors, \$45,998.03; value of supplies and material consumed, \$1,774,340.92; rent, tax and miscellaneous expenses, \$523,639.88.

PUMPING ON THE COMSTOCK.—The Virginia Enterprise says: John W. Mackay is on the Comstock. When last upon this coast very favorable reports appeared in print with regard to the prospect for the resumption of deep mining upon this lode, Mr. Mackay was represented to be a warm advocate of the measure; Sam and Senator Jones were in it; H. M. Levy and friends were all right; certain minutiae was simply to be arranged, and work was to begin. The Enterprise does not believe the above reports were given the free flow of newspaperial wind simply to walk stoops on high. It believes that the gentlemen in control in all sincerity entered into arrangements to pump water, and it hopes that during Mr. Mackay's presence on the coast, arrangements will be completed whereby all the mining companies on the lode will enter into a powerful and harmonious combine to drain the mines to the 3000 level at least. Money can be raised for this purpose. More money can be got for pumping water than can be had for circulating around porphyry flats. Besides the prospects are inviting. The Combination shaft quit on the 3300 level in as favorable a formation as the Chollar croppings show. A strong body of fair-grade ore was struck on the 2700 level of Belcher. On the 2200 level of Eschschlager there is another good body of ore. There is still another promising body of ore on the 1900 level of Con. Cal. & Va. From the 2200 level of Chollar and Potosi downward there is as promising a quartz formation as was ever seen on the lode. An immense amount of work has already been done; shafts have been opened; there is plenty of machinery on the lode; let us pump.

The Late Edward Burgess.

The most noted naval designer of the day, Edward Burgess, died at his home in Boston July 13. He was known as the most successful yacht designer of the century, and one who devised new forms which excelled all those previously built. Mr. Burgess was a native of Boston and a graduate of Harvard, where he afterward served as instructor in entomology. For 15 years he was Secretary of the Society of Natural History in Boston. Mathematics had been a favorite pursuit, and as a recreation he began to apply his mathematical conclusions to naval architecture.

A few years ago, when the English yachts challenged America in a race for the America's cup, Mr. Burgess designed the yacht *Pariten*, which successfully defended the cup. The following year he built the *Mayflower*, which again won the international race. The third year he built the *Volunteer*, which for the third time beat the piked English craft and took the laurels for our country. Mr. Burgess has designed many other yachts and trading and fishing vessels, all of which showed remarkable speed. Some time since, he abandoned all other work for that of naval designing, which brought him fame and fortune. He was 43 years old at the time of his death. The genius of this man has brought about a marked advance in the science of naval designing, the influence of which will be felt for many years.

The funeral of the late Edward Burgess took place at Trinity Church, Rev. Dr. Phillips Brooke officiating. The pall-bearers were: General Charles Paine, Mr. Allerton, William Tucker, Henry S. Hovey, Amory A. Lawrence, Franklin Dexter, Dr. John Bryant, J. Malcolm Forbes and Dr. W. F. Whitney. There was also a notable gathering of prominent yachtmen and leading citizens. Fleet Captain Peabody represented Commodore Gerry of the New York Yacht Club and ex-Commodore S. Nicholson Kene; Secretary J. V. S. Oddie, Commodore L. D. Morgan and Superintendent Niele Olsen came from New York to attend the funeral. All the ex-Commodores of the Eastern yacht clubs, and also the Commodores and flag officers of the local yacht clubs, and delegations representing the Seawanhaka and Larchmont yacht clubs were present. Letters and telegrams expressing sympathy with the widow of the deceased in her bereavement were received from all parts of the country.

Edison Incandescent Lamps.

Advices from New York, dated July 14, are to the following effect:

In a suit of the Edison Electric Light Co. against the United States Electric Light Co., for an infringement on a patent for incandescent lights, Judge Wallace to-day rendered a decision in favor of Edison.

The decision broadly, squarely and fully sustains the Edison patent. Judge Wallace also orders an injunction against the defendant and an accounting of the profits for past manufacture. The present output of incandescent lamps in this country is about 50,000 a day, only half of which are now made by the Edison company. That company asserts that the decision gives it a monopoly. The patent was sustained by two appellate courts in England, and the decision of Judge Wallace apparently agrees with the English decisions. It is thought the Thompson-Houston and Westinghouse companies will continue their business much as before. The patent has only two or three years more to run. The United States company, against whom the decision was rendered, proposes to appeal at once.

"Mr. Edison's invention," said Mr. Eaton of Eaton & Lonia, his counsel, "was made in 1879, and the patent was granted in 1880. This suit was commenced in 1885 and is one of the most important of a series of suits for many years prosecuted by Edison's company to establish Mr. Edison's priority. The other suits, one system on the distribution of the electric current for electric lighting, another on what is known as the three-wire or economical system of circulating current, and the third subdivision current, are ready for court and will be argued in the autumn. The Edison company, however, claims that this present decision is so broad and controlling as to render the commercial value of the other decision, even if made in their favor, as of second importance."

"THE MINERS' BEST FRIEND."—The MINING AND SCIENTIFIC PRESS of San Francisco has just completed its sixty-second volume. Having known it since its birth, having read it carefully since then, we can safely affirm that it is and has been the miners' best friend and educator. Over 20 years ago, when we were begging the Federal Government to "stop the war," here, the old MINING AND SCIENTIFIC PRESS stood with us, and Crook, who "broke the backbone of the Indian war," was sent us.—*Prescott Courier.*

EDISON is a new town in Washington, where the shops of the Northern Pacific Railroad Co. are being put up. Fourteen buildings comprise the present structures, and the yards cover 60 acres. The buildings are done and the machinery is being put in. When everything is done the expenditure of money will exceed \$1,000,000 and 2000 men will be employed before the end of the first year.

The Precipitation of Metals from Hyposulphite Solutions.

(Read by C. A. SYKES, JR., of San Francisco, before the American Institute of Mining Engineers.)

Metallurgical processes cannot be conducted successfully without the aid of analytical chemistry. The great perfection of lead smelting in the West, for instance, has only been accomplished by the analysis of ores, fluxes, slags, and all products of the furnace. Ores are mixed and fluxed to obtain a slag of desired composition. Account is even taken of the composition of the ashes obtained from the coke. The "muscular" smelter has left the field forever! This state of affairs has been induced by sharp competition, i. e., by a complete separation of the industries of mining and reducing ores, not by the liberality and wisdom of directors and stockholders to provide laboratories and engage chemists, or by their love for scientific investigation.

It would be considered absurd, at present, to run a lead smelter, a blast furnace for pig iron, or a Bessemer plant, without the assistance of a well-equipped laboratory and a chemist, but it is considered quite sufficient to provide amalgamation or lixiviation works merely with a crude assay office, and an assayer who is paid less than a laborer in the mill.

In my opinion, this will change in the near future. By the exclusion of Mexican lead ores, and their growing scarcity in the West, smelters have been forced to raise their charges on so-called dry silver ores, and cannot handle the latter now in such unlimited quantities as formerly. The inevitable result must be that the surplus of these dry silver ores, especially those of low grade, will be reduced by processes cheaper than smelting, and here the introduction of lixiviation has an excellent field, provided the muscular lixiviator has an able chemist for an assistant.

It is to be regretted that so little analytical work has been done in lixiviation. We know almost nothing of the composition of roasted ores before and after lixiviation; of the constitution of the first wash-water and of lixiviation solutions after prolonged use; of the chemistry of sodium and calcium sulphides; of the composition of sulphides and carbonate precipitates. Without such work material progress is not possible.

Errors Repeated.

During the last seven years a great number of papers on lixiviation have been published, containing a good deal of valuable information, but also many errors due to hasty and incomplete investigation without thorough analytical work. Writers of metallurgical treatises, myself included, have repeated these errors like parrots—what else could they do? I will point out a few. We find it almost everywhere stated that in boiling caustic milk of lime with sulphur the lower osmium polysulphides cannot be produced, because they are insoluble. This is not correct. CaS cannot be obtained in the wet way or in solution. If it is made by heating CaCO_3 in fumes of CS_2 and CO_2 , and brought in contact with water, CaH_2O_2 and CaH_2S_2 are formed, the latter being readily dissolved. According to the best authorities, CaS and Ca_2S do not seem to exist at all, at least not in aqueous solution. If caustic lime is boiled with sulphur, the tendency prevails to form CaS , even if an excess of lime is present, not because CaS_2 and CaS_3 are insoluble compounds, but because calcium has stronger affinities to unite with four equivalents of sulphur.

A more serious error occurs in Daggett's paper, *Trans.*, xvi., 423, in regard to the abnormally high precipitating coefficients of sodium sulphide prepared according to Russell's directions. Believing in the correctness of Russell's experiments, I built upon them an elaborate theory in my book on the *Lixiviation of Silver Ores with Hyposulphite Solutions*. Aaron was the first who proved that these abnormal precipitating coefficients exist only in partial precipitation, which Russell has entirely overlooked; hence they have no existence in practical mill-work. That Aaron's results are correct I know from personal observation. In the following I have to record another important error. In Daggett's paper, already quoted, we find on page 430 that calcium monosulphide is precipitated by Russell's sodium sulphide if the hyposulphite solution contains calcium salts. The yellow precipitate of calcium sulphide is said to appear after nearly all the silver, copper and lead have fallen out. I have no doubt the precipitate occurs, and looks yellow, but it is not CaS , or CaS_2 , or any other calcium sulphide. Like all other faithful writers of books, I have also endorsed this statement in my treatise on lixiviation.

The Metals Playing an Important Part

In precipitation from hyposulphite solutions, resulting from the lixiviation of silver ores, are silver, copper, lead and calcium. The quantity of gold that may be present is too small to enter into calculation. Silver and copper are always precipitated as sulphides by sodium or calcium sulphide; lead and calcium may be precipitated as carbonates by Solvay soda; or lead alone as hydroxide by caustic lime. Sodium sulphide can be used either as a mixture of Na_2S and Na_2S_2 , which we will designate in future as "Russell's Sulphide," or Na_2S_3 , or a higher polysulphide. Calcium sulphide is always used as CaS_2 . For precipitat-

ing lead, caustic milk of lime is prepared with hyposulphite stock solution. Solvay soda is also dissolved in stock solution.

Calcium may also be precipitated by a sodium sulphide solution, as will be fully discussed later on. Caustic lime and Solvay soda are always used before calcium or sodium sulphide.

In the absence of calcium, the lead carbonate precipitated by Solvay soda can be obtained practically free from silver; that is to say, after washing it with fresh hyposulphite solution. From Ontario ore, for instance, Russell obtained in this way lead carbonate with only two ounces of silver per ton. If calcium is present, the lead-calcium carbonate contains more or less silver, and may be very rich. According to Wilson and Russell, the silver does not increase in proportion to the calcium precipitated. Russell also claims that washing the precipitate with pure or more concentrated hyposulphite solution will reduce its value in silver considerably.

This is not clearly established. At the Marsac mill, one lot of carbonates was recently produced containing 8.1 per cent lead, and 392 ounces silver per ton; and another lot containing 19 per cent lead, and 1269 ounces silver per ton. I do not know the exact circumstances under which these carbonates were obtained. Evidently, this subject, like so many others in lixiviation, needs a thorough analytical investigation.

Lead hydroxide precipitated by caustic lime is generally rich in silver. According to Rueger, the lead precipitate obtained at the Mount Corry mill, Nevada, contained 60 per cent lead and 420 ounces and more of silver per ton.

The separate precipitation of lead and calcium may be not only economical directly, but also indirectly by the production of silver sulphides of higher grade.

Since the introduction, by Kiss, of CaS_2 as precipitant, the majority of metallurgists have tenaciously adhered to this practice, evidently without examining the subject critically. The question has become more complicated by the recent introduction of methods for separate precipitation of lead, and of the Russell process. It is hardly necessary to add that the problem also includes the question whether a sodium or calcium hyposulphite solution deserves preference in lixiviation.

Although lixiviation is now always commenced with sodium hyposulphite, this salt is gradually replaced by calcium hyposulphite if CaS_2 is used as precipitant.

In the following I propose to present in a systematic manner the most important facts that have a practical bearing upon the subject of precipitation. The reader, however, should not expect a complete and exhaustive treatise, for which analytical data are entirely lacking.

1. Preparation of Sodium and Calcium Sulphides.

Both reagents are prepared by boiling either a concentrated lye of caustic soda, or caustic milk of lime with sulphur. In making calcium sulphide, sufficient sulphur must be added to the caustic lime to obtain CaS_2 , because lower calcium sulphides are not formed. In fact, the solution contains CaS_2 , even if an excess of lime is present, while an excess of sulphur produces CaS_3 . From the slight solubility of calcium hydrate in water, it follows that this process must require considerable time, and that at the end of the operation, a solution of only moderate concentration must result. From sodium hydrate, on the contrary, a lye of almost any concentration can be obtained, as well as sodium monosulphide, and all of the polysulphides. Hence, the process must be completed very rapidly, and, if the lower polysulphides are desired, with a minimum consumption of sulphur.

The mode of preparing calcium sulphide is well known. I will only call attention to the facts that it is troublesome, wasteful in chemicals, amount of steam and time consumed, and that an excess of sulphur should be used to obtain CaS_2 .

Russell discovered a practical and easy method of preparing sodium sulphide. According to his directions, the contents of a drum of caustic soda are broken into lumps and dissolved with the aid of steam in a minimum of water, thus forming a very concentrated lye. The operation is conducted in a cast-iron tank three feet diameter and seven feet high. When the lye has reached a temperature of not less than 100°C , sulphur is gradually added, two-thirds of the weight of the caustic soda. A most violent reaction takes place, the mass foaming considerably. This, however, is caused by disengagement of steam, and not of any other gas. After all the sulphur has disappeared, the product is allowed to cool, dissolved by adding hyposulphite stock solution, and discharged into a storage-tank, where the solution can be diluted still further. In two hours, 700 pounds caustic soda, the contents of one drum, can be easily converted into sodium sulphide. The solution contains a mixture of Na_2S and Na_2S_2 .

The quantity of sulphur used for making Russell's sulphide is somewhat empirical. The two-thirds rule may be very convenient for the laborer; but metallurgy has not been invented for his convenience. As will be seen at once, the rule does not at all consider different grades of caustic soda, which may contain from 85 to 95 per cent NaHO , thus producing sodium sulphide differing materially in composition. If we use sulphur with 95 per cent NaS , and caustic soda with 95 per cent NaHO , the resulting

sulphide will be $\text{Na}_2\text{S} + \text{Na}_2\text{S}_2$. If, however, the caustic soda contains only 85 per cent NaHO , the sulphide will have very nearly the composition $\text{Na}_2\text{S} + 4\text{Na}_2\text{S}_2$.

This subject will be further discussed in the following paragraphs.

(To be Continued.)

Iron on the Pacific Coast.

The American Manufacturer and Iron World of Pittsburg appears this week in a new and more convenient form, decidedly improved in appearance. The editor, Mr. Joseph D. Weeks, visited this coast last month on a tour of investigation among the iron and coal miner. In the last issue of his paper is published the following editorial:

The articles published in our Iron Ore Department this week on the discovery of a Bessemer ore in Southern California brings up the whole subject of the manufacture of iron and steel on the Pacific Coast. At present, the production of iron and steel west of the Rockies is confined to the output of a single charcoal blast furnace at Oswego, near Portland, Oregon, producing about 40 tons a day, and to the four rolling-mills in and near San Francisco, Cal., producing not to exceed 50,000 tons of iron and steel a year. There is a blast furnace at Ironside in Washington on Puget Sound, but it has been idle now for 18 months, while the California charcoal furnace that last made iron in 1886 has been abandoned. A furnace is under construction at Kittland, Wash., near Seattle, the stock bins and the auxiliary buildings of which were up and the excavations for the foundations of which were nearly finished in May of this year.

The difficulty in the way of the development of the iron and steel industry of the Pacific Coast at least up to the point of supplying its own demand has been fuel. California has no mineral fuel that can be used at all in the manufacture of pig iron and such deposits of iron ore of a good grade as it possesses are at present so located with reference to fuel that can be brought in from abroad or from other States as to put out of the question at present the manufacture of pig iron from native ore with anything but charcoal and it is probable that the cost of charcoal iron laid down at San Francisco which is the chief point of consumption would be much above the price at which good foreign pig iron could be bought.

The mills of San Francisco depend almost entirely upon anthracite coal. This costs the mills from \$7 to \$8 a ton laid down at the works and though Washington coal can be laid down at a lower figure it is regarded as more economical to buy the anthracite coal.

With coal at these figures and pig at \$26 a ton it will be seen that the iron and steel works of California are heavily handicapped from the start, and yet there are mills at San Francisco which in spite of all drawbacks have a record of which to boast.

But it is not in California but in Washington that the "Future Situs" of the iron and steel industry of the Pacific Coast is to be located. Oregon on the seaboard has some coal, but it is on Puget Sound in Washington that the best coal in greatest abundance is to be found.

The coal all through this section is cretaceous, a much younger formation than the carboniferous of Pennsylvania. It was all originally lignite, and even now most of the deposits are of this grade. In some places, however, notably near Wilkeson, the action of the heavy covering in freeing the Pennsylvania and other Eastern coals of the excessive water and volatile matter and making them true bituminous coals has been supplied by the heat of the pressure and firebricks, and the lignite has changed to a good bituminous and coking coal. A very good coke is made from this Wilkeson and similar seams, while there is an abundance of coal not coking that can be used readily in heating, and especially in iron and steel manufacture where producer gas can be used.

In the neighborhood of this coal good iron ores are found. The magnetic ores of the Cascade range are somewhat similar to those of Cranberry, N. C., and there is no doubt but that iron ore of a good quality and in large quantities exists not far from the coals near Seattle. Magnetite from Mt. Logan shows (average of five analyses) 69.26 iron, 1.96 silica, .03 phosphorus. The iron and steel works now in course of erection at Kirkland will use ores of this grade.

It is on Puget sound that the iron and steel industry of the Pacific Coast must be located. Far-seeing business men are realizing this. The Kirkland iron and steel works, the wire-nail mill that is in course of construction, the iron ship-yard that is being built, are all evidences of this. And Puget Sound is not only to make iron and steel for the Pacific Coast, but for much of that vast horde of people who get their supplies over the Pacific ocean. Costs at present are excessive, but these will be reduced. Coke cannot always be sold at \$7 to \$12.50 a ton, but when the abnormal labor and speculative conditions that now exist become normal, then Puget Sound will take its rightful position as a great iron and steel producer.

Bessemer Iron Ore in California.

The following is the article alluded to in the first part of the editorial:

A correspondent of the *Bulletin* of the American Iron and Steel Association describes in that journal a deposit of magnetic iron ore sit-

uated in California about 150 miles east of Los Angeles, and 12 miles off the Atlantic & Pacific railroad. He describes the ore as lying in a well-defined contact vein between walls of granite and syenite, and is from 400 to 600 feet in width by 3000 feet in length, and apparently of great depth. In places along the hills through which the vein runs it rises to nearly 100 feet above the surrounding rock. The ore is quite accessible and can be mined at very little expense. As shown by analyses, the ore is very pure. The determination by leading chemists of this country of the objective contents is as follows:

	Per cent.
Iron.....	68.84
Manganese.....	0.088
Phosphorus.....	trace.
Sulphur.....	0.078
Titanium.....	0.20

"The silica runs below two per cent and titanium a trace."

"A Pittsburg engineer, posted on the cost of fuel, etc., places the expense of producing a ton of pig iron at a point in California convenient to this iron ore deposit at \$13.75 per ton, on the basis of ore carrying 50 per cent of metallic iron. The property does not produce any ore running under 60 per cent of metallic iron. Charcoal would be the fuel to be used, and it is available in sufficient quantity."

"The present consumption of pig iron in California would absorb the output of a blast furnace producing 100 tons of iron daily, and the prices now paid in that State for pig iron, varying from common coke to charcoal iron, range from \$26 to \$35 per ton, which prices would admit of a clear net profit of from \$8 to \$17 per ton."

"There is no other such body of ore, having the dual qualifications of purity and quantity in the Far West, and no other which could compete with this were it developed."

The *Manufacturer* adds: While the analyses show a remarkably pure and good iron ore, it is hardly correct to say that there "is no other such body of ore" in the Far West. The Shasta iron ore in the same State is fully as good for all practical purposes as this (Southern California) ore. The mammoth vein of Gunnison, Col. ore is also as pure an ore.

The difficulty in making pig iron in California is lack of fuel and the great cost of transportation to the seaboard where it is consumed. This pig iron, which it is claimed can be made for \$13.75, is some 700 miles from San Francisco on railroads that would charge say 2 cents a ton a mile or \$14 freight. This would make the cost at San Francisco, the chief point of consumption, even if the pig could be made at \$13.75, at least \$27.75, while a good grade of Bessemer pig can be bought at San Francisco for \$26. The consumption of pig at points nearer Los Angeles would hardly justify the erection of a 100-ton or even a 50-ton furnace.

What is Forestry?

The U. S. Department of Agriculture will presently issue through the Forestry Division a 50-page bulletin (No. 5), entitled "What is Forestry," a compilation and enlargement of several addresses on this subject delivered by Prof. B. E. Fernow, Chief of the Forestry Division.

It treats the subject in three chapters. The first presents briefly the important part which our forest resources play in the national economy. The second shows the principles which underlie a rational system of forest management in a wooded country, giving especially and in sufficient technical detail the considerations involved in the practice of "timbering." The third part treats of forest planting in the treeless country, discussing the rationale of forest planting in so far as it differs from mere tree-planting, and giving in detail rules for the selection of various kinds of trees in "mixed" planting. Two letters from tree planters on the Dakota plains, giving the results of actual experience with the methods commonly pursued, form an interesting appendix.

The bulletin is designed to present the question of forestry plainly, divested of the scientific terms which must necessarily accompany a technical discussion, and to serve not only for the information of the owner of timber lands, of the farmer whose farm contains a certain area of woodland requiring intelligent treatment or who desires to devote a portion of his farm to timber, and to the settler on the Western plains, but to the citizen with whom forestry and the management of our forest resources is simply an important economic question. In view of its general character, a large edition of this bulletin will be published. Copies are to be had on application to the Secretary of Agriculture, Washington, D. C.

For the coming Fair of the Mechanics' Institute in this city, a new plan for the arrangement of exhibits has been approved. It gives greater free space in the center of the Pavilion to accommodate those who wish to be near the music. As music is to be one of the most prominent features, the space allowed will provide for the accommodation of very many more people than at previous exhibitions. Nearly all the available space for exhibits is now exhausted, and those who desire to secure places are requested to make application at once.

The required subsidy of \$15,000 having been raised, the motive power of the road from Los Angeles to Vernon, about three miles in length, will be changed from horses to electricity.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BELMONT MINE.—Amador Ledger, July 18: The superintendent, J. H. Tibbits, reports: Tunnel No. 1 is now in 260 feet. The ten-stamp mill is running nicely and doing good work. Stopes above tunnel level are looking well and yielding the usual amount of ore.

MISCELLANEOUS.—At the Clinton Consolidated they have just completed the burning of a kiln of brick, which is to be used in the building of chlorination works. At the Bellwether claim near Jackson they are still drifting both north and east. They have run about 70 feet without cutting the ledge.

FROM SUTTER CREEK.—The laying of the pipe at the South Eureka will commence in a short time. It is nearly all on the ground ready for laying, but owing to the extreme heat the pipe is so hot that they cannot handle it. They are making good headway with the hoist, and as soon as the pipe is in position everything will probably be ready for turning the water on, when sinking will be greatly facilitated.

MORE RICH ROCK.—Dispatch, July 18: Another lot of very rich rock was taken out of the mine owned by Mello, Questor and others at the Jackson Gate a few days ago, which makes even a better showing than any that has heretofore been taken out. They have already developed the ledge to the width of about 35 feet, and have taken out several tons of rock which they will soon have crushed in order to get a fair average test of the richness of the ore from different parts of the ledge.

Mono.

THE LAKEVIEW MINE.—Bridgeport Chronicle-Union, July 15: On Tuesday evening we had the pleasure of a short interview with Chas. A. Dyer of Calais, Me., one of the owners of the Lakeview mine at Lundy, in the Homer mining district, who is here in the interest of the company, which is composed of Calais and Portland, Me., capitalists. The company has purchased the Spaulding mill at Bodie—a 10-stamper, which is being removed to Lundy, where it will be erected and made a first-class plant. A tramway will be built from the mine to the mill for the transportation of the ore, which can be dumped into the mill at a trifling cost per ton, and as the mill will be run by water-power it goes without saying that the cost of working the Lakeview ores will be extremely light, enabling the company to run all its ore through the mill without the expense of sorting it. The Lakeview is rich in gold, and the mine will be worked systematically, as a good mine should be, and not on the "gnuge-eye" plan, as many of the mines in this county have been worked. R. T. Pierce, the superintendent, is well known throughout the county as a thorough miner and good business man, and his energy and management have brought the Lakeview to the front. Mr. Dyer will remain about three months, and after spending the winter at home he intends to return next spring. He is highly elated over the developments already made in the mine.

THE DUNDERBURG MINE.—The work of repairing and cleaning the Dunderburg tunnel is being pushed by Supt. Purdy, who has retimbered the entrance, many of the old timbers having caved in after these many years. The tunnel will be cleaned out next week, and several tons of average ore will be taken out for a mill test. When this mine was first opened, some 20 years ago, quartz mining was in its infancy and the processes for working ores were not as efficient as at this time, and refractory ores could not be worked at a profit, and the ores from this mine were of this class. Now there is nothing to prevent the working of the Dunderburg ore, and we are confident the result of the coming test will be satisfactory to the intending purchasers, an English syndicate. The tunnel is in over 700 feet, and drifts were run north and south on the front ledge, the back one not having been prospected thoroughly. There is a large amount of good ore on the dump which will pay to work. This mine is well situated for economical working, water-power and timber being close at hand. The surroundings are pleasant and there is a good townsite adjacent. The mine is about six miles from Bridgeport, on an air line, but by the wagon-road it is farther.

NOTES.—Much work is being done in the Patterson district. The Rattler continues to show good ore. There is a good prospect of the Kentuck. Great Western and one or two other mines are being sold to strong companies. The work in the combination shaft and tunnel of the Goleta, Montecito and Sterling claims, Jordan district, is progressing finely, and will bring that district to the front. In the Homer district, aside from the Lakeview, a great deal of substantial work is being done. A few days ago a \$5000 shipment of bullion was made from the district, the result of the working of a small lot of Lakeview ore. Now that Homer district has dropped the London incubus, it will forge ahead and soon become an active agent in the monetary world. The Standard Con., at Bodie, is making monthly shipments of \$25,000. There is nothing new to report of the other Bodie mines which are being steadily worked. The Bentonians are quietly working their mines, shipping their ores to the reduction works, receiving their bullion and spending it as their needs and pleasures incline them. Taking the county as a whole, its mining prospects are brighter than they have been for many years, and another year will see us with a greater assessment roll and a lower rate of taxation—evidence of prosperity and thrift.

Napa.

KNOXVILLE.—Cor. Napa Register, July 17: The Knoxville mine, which has been in a comatose state for several years, is in a fair way of coming around again. Anton McMillan, the present owner, is doing wonders with the limited capital at his disposal. He has completely abandoned working from the old works (the shaft of which was down over 600 feet), and started on new ground and sunk a shaft, now down over 200 feet. Jim Raphael, the underground foreman, has drifted 175 feet south-west from the boom level and run two crosscuts from end of same level 60 feet northwest and 75 feet south-west. Just now they are getting out some rich ore

in both the cuts, and they know it is good for 30 feet ahead, as Jim has prospected that distance. The cinnabar is just as rich as that the old company were getting the last seven years of their running, and they averaged 200 flasks per month for that time. In their best days they have between 400 and 500 men on their pay roll, and their monthly output ranges from 600 to 1000 flasks per month, and the dividends of one year amounted to \$450,000. But in those days things were run at high pressure. They extracted everything in sight. Prospecting was not pushed as it ought to have been. It was either a feast of metal rock or a famine, and then there was a shut-down of the furnaces till a new supply was found. And then the final collapse of the big concern came. 'Twas a pity, as there were generally about 40 families employed by the company. At present there are about 30 men employed in the Knoxville mine. About one and one-half miles northwest is the Manhattan. It has been running 25 years. Knox & Osborne are its owners. They invented the modernized furnaces now in use all over this State. They employ about 30 men.

Placer.

IOWA HILL PETITIONERS.—Placer Herald, July 18: A committee of citizens from Iowa Hill, consisting of S. M. Sprague, M. R. Gleason, J. F. Brown and others, waited on the supervisors of Sacramento county this week with a strong petition asking that no injunction be laid against the miners of Iowa Hill that would prevent them from working the lower or heavy gravel strata of their mines the debris from which never reaches the American river, or that would interfere with drifting. The committee of miners, which even the Bee had to admit were a fine lot of well behaved gentlemen, represented that such work as they desired to prosecute could be performed without injury to Sacramento or the valley in the least, and they asked that the board visit the locality and satisfy themselves of the truth of these representations before permitting an injunction that would necessarily ruin the mining industry at Iowa Hill entirely. Though Chairman Greer, of the board, opposed making the trip to the Hill, and argued in favor of hitting the miners as hard as he could, showing no more feeling for his fellow men in this case than as though the miner was a Hottentot and he was a king, yet the majority of the board manifested more reason and decided finally to visit the mines at a date to be hereafter selected. This effort of the Iowa Hill Committee deserves praise, for anything that brings the contending factions nearer together and leads to a better understanding of the situation must result in a modification of the unnecessarily bitter feeling which is the cause of much of the present difficulty, and which stands in the way of any reasonable suggestion for a practical solution of the trouble. It seems an later information that an injunction has already been laid against the mines of Iowa Hill which is extreme in its provisions, and the committee ask to have it modified to an extent that will allow them to mine where no injury will result. Every element of humanity and justice demands that their petition be granted.

Plumas.

CLEANUP.—Plumas National, July 18: Eyraud & Co. who are mining at Indian Hill, on the East Branch, will make a nice cleanup we are informed. Owing to difficulties contended with this season, they were unable to keep steadily at work, but nevertheless the yield from their mine will be in the neighborhood of \$3000. And still some say the mines of Plumas county are played out. On the contrary Plumas is yet in her infancy, so far as mining is concerned. The machinery for the mill at the old Jackson quartz ledge is all on the ground, and is now being put up, and the mill will be in operation by the first of August. The owners, Sutton, Orr, and others, have lots of faith in this mine, and with reason, too, for a good prospect can be got anywhere on the ledge, and say before many weeks they will surprise the quartz miners of Plumas with rich developments.

AT THE DEERY MINE, situated near Greenville, we are told that for ten days' run from 15 stamps, \$4000 was cleaned up a short time ago. This mine is owned by Standart & McGill, and is one of the many good paying mines in that section. We hope the lucky owners will continue to take out the gold by the pound.

AT THE GREEN MOUNTAIN mine near Crescent Mills in Indian Valley, everything is moving along in good shape, under the supervision of G. P. Cornell. The tunnels have been opened up for quite a distance, and a ditch for the new pipe to be laid from the Round Valley reservoir has been dug, flumes and pipes repaired, and it will not be long before the mill will be ready to start up. About 40 men are now employed at this mine. This in connection with the Crescent mine, makes Crescent Mills one of the liveliest mining camps in Plumas. Among the pleasant sights noted by a Mercury reporter early this morning was the passage along Myers street of heavily laden teams, conveying the machinery for a ten-stamp quartz mill, to be erected on a mine in Plumas county; owned by Captain J. W. Smith of Oakland. The mine is known as the Buck Whiting mine, and is located at Rich Bar. The mill reached Oroville, consigned to H. C. Bell & Co. forwarding merchants.—Oroville Mercury.

The machinery mentioned in the above is for the Shenandoah mine at French Ravine, and owned by an Oakland Co. Capt. J. W. Smith has taken a contract to put the mill up and has already a wagon road about completed for the purpose of hauling the machinery to the mine. Mr. Charles Mather a native of Plumas county, whose father now lives in Oakland, and who owns stock in the above mine, was recently appointed superintendent of the mine, and will commence taking out quartz next week.

San Bernardino.

MORONGO DISTRICT.—Riverside Press and Horticulturalist, July 18: The Rose mine in the Morongo district has been purchased by D. A. Wheeler & Co. for \$30,000 cash. This is the rich mine we mentioned a few days ago as running \$400 to the ton. **GAVALAN MINES LEASED.**—Col. E. N. Robinson of the Cajalco tin mines was in San Diego the other day, with some fine specimens of tin ore. As we learn from the Union, the rock was taken from a new winze or shaft 16 feet below the old workings. Development, it is understood, is resulting satisfactorily at the Cajalco camp; everything is progressing smoothly, but little work is being done at the lower dam. The San Jacinto estate has leased about 6000 acres of mineral land to a Chicago syndicate

for a term of ten years. The lease includes the old Gavilan gold mines. The company receives a stipulated nominal sum annually and 20 per cent of the gross output of the mines. The Gavilan mines in former years paid well, even though arastras and a small stamp mill some miles distant were the only means used in crushing the quartz. The remains of the 30 or more old arastras are still to be seen about the mines.

Sierra.

CHINESE BONDS.—Mt. Messenger, July 18: A company of Chinese has bonded the roof gravel mine, located east of Sierra City for a period of five years, and will proceed to open and prospect the same. This mine has not been worked for several years, those who opened and prospected it never having been able to find the pay channel. The theory upon which the original prospectors proceeded was that the channel upon which the B. M. Ex. Co. is now working, came down from the vicinity of Gold Lake, and that they had a portion of it. Whether this be the true theory or not, has not yet been proven.

PROSPECTING FOR GRAVEL.—A Larabee and Eddie Owens are at work prospecting an island in the river about two miles below Goodyear Bar. They are after a bed of gravel which underlies a body of pipeclay. The early miners worked down to the clay and thinking it was a kind of bedrock, went no further. An unworked portion of the river bed is supposed to underlie the pipeclay. The question is, how came this large body of pipeclay in the bed of the river? Where did it come from? Did it come from some Pliocene channel which crossed the country at an altitude of 2000 feet above its present resting place? If so, what preserved it for the vast lapse of time which was required to erode the canyon of the Yuba to its present depth.

GOLD FROM DRIFTING.—The yield of the B. M. Ex. Co. for last week, was 83 ounces worth, \$18.70 an ounce. We do not know the number of drifters employed, but the total number of men at work inside and outside, is said to have been about 30. One nugget weighed 21 ounces.

SIERRA BUTTES.—The work on the Sierra Buttes flume is progressing rapidly. They hope to complete it in a few weeks. The mill will be completed in about three weeks.

Trinity.

NEW FIND.—Trinity Journal, July 18: It is reported that D. C. Dedrick has found a rich prospect at the head of West Weaver—on the Weaverville side of Bally.

RIDGEWAY.—We learn that the Ridgeway mine is still looking very well and that the mill will be started up soon. They have considerable work to do to put the mine in good working condition.

Yuba.

A DEERIS DAM.—Marysville Democrat, July 17: We have been informed by parties who are in a position to know, that the Excelsior M. Co. contemplates the erection of a large dam on the old bedrock channel leading from their mine at Smartsville to Timbuctoo. The object of the dam is to impound the debris from the mine with a view of operating said mine at times by the hydraulic process. The dam is to have sufficient capacity to hold the debris for several years, and after it has been completed the company will ask the proper authorities to pass upon it, and, if satisfactory, will ask for a modification of the injunctions now upon them. At present the mine is being worked by the drift process, which is not so rapid and far more expensive than the hydraulic method. The company hopes to satisfy all parties interested that the debris can be safely kept from the Yuba river.

NEVADA

Washos District.

CON. CAL. & VA.—Virginia Chronicle, July 18: 1100 level: At the point in the south drift from the shaft station on this level where the ore discovery was made we have continued to stope out ore of good quality below the sill floor, working from the bottom of the winze (18 feet down) upward. 1300 level: Have extracted some milling ore below the sill floor of the crosscut run east from the south drift, 1500: From the end of the crosscut run west from the north drift on this level we have continued to extract good ore from the sill floor upward to the ninth floor. The stope above the ninth floor is in low-grade ore. 1600: The ground in the vicinity of the drift run east through the old stopes on the sill floor of this level continues to yield some ore. Have continued to stope out good ore at the point which is 200 feet south from the north line of the mine, and 44 feet above the sill floor of this level. 1650: The various openings of this level have continued to yield the usual quantity of ore. Ore of fair quality has been extracted from the drift run west from the top of the upraise carried up 59 feet above the southwest drift, also from the drift run east from the winze No. 3, 73 feet down, in working upward from that point. 1750: In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. There has been extracted from all parts of the mine during the week 2326 560-2000 tons of ore of which 895 1350-2000 tons were shipped to the Morgan mill and 1430 170-2000 tons to the Eureka mill. The average assay value of all the ore worked at these two mills during the week (2360 tons) was \$23.85 per ton. Bullion shipped to Carson mill, assay value \$20.92.82. Bullion now on hand in our assay office, assay value about \$25,000.

OPHIR.—1465 level: We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore has been extracted during the week. 1500: Have continued repairs on the incline leading from the shaft station on this level.

MEXICAN.—On the 1465 level the east crosscut No. 1, at a point 618 feet in from the main north lateral drift, has been advanced 30 feet in soft vein matter and clay carrying narrow stringers of quartz.

UNION CON.—A northeast drift started from the east crosscut No. 2 on the 1465 level, at a point 853 feet in from the main north lateral drift has been extended 26 feet in a mixed formation of clay, porphyry and quartz.

BEST & BELCHER.—1000 level: East crosscut from northwest drift advanced 10 feet; total 75 feet. Face in porphyry and stringers of quartz. West crosscut No. 1 has been advanced 18 feet through hard por-

phyry and stringers of quartz. There is water still flowing from face of same.

GOULD & CURRY.—On 200 level: Have done considerable repairing in upraise No. 2, also carried it up seven feet; total height 95 feet; face in hard quartz showing some value. East crosscut No. 1, 65 feet above this level, has been extended 15 feet; total 55 feet; through porphyry and quartz giving low assays. West crosscut has been advanced 14 feet; total length 82 feet; through soft porphyry. Have done considerable repairing on the 400 level in order to keep connections open.

OCCIDENTAL.—Extracted 240 tons of fair-grade ore from the stopes on the 350, 400 and 450 levels. Have put in a chute and are now prepared to extract ore from the 600 level. At a point 150 feet south of No. 1 winze, 750 level, have started an east crosscut from the main south drift. The face is now in low-grade quartz. Have milled during the week 210 tons of ore of the average value of \$14.90 per ton.

SIERRA NEVADA.—On the 630 level west crosscut No. 1, from the northwest drift, 571 feet from the shaft, is advanced 687 feet, 37 feet having been made during the week; formation siliceous in character. The Kenosha tunnel was enlarged and repaired 31 feet during the week. Total, 441 feet.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level is out 37 feet; face in quartz yielding low assays. North drift from winze, 80 feet north of shaft, 550 level, is out 24 feet; face in quartz and clay. The south drift, same level, is out 22 feet; face in quartz showing bunches of ore.

CHOLLAR.—The east crosscut from the joint Chollar and Norcross winze 1500 level, is out 20 feet; the last 12 feet in quartz yielding low assays. Extracted and sent to mill the past week, 527 tons of ore, worth \$19.89 a ton as per battery assays.

UNION SHAFT.—The west drift from the shaft, 900 level, has been advanced during the week 70 feet, making a total distance of 643 feet; face in clay and porphyry.

ANDES.—On the 420 level repaired a portion of the east crosscut. North drift from east crosscut was advanced 9 feet; formation quartz and porphyry. East crosscut No. 3 advanced 16 feet; in quartz yielding low assays.

POTOSI.—The winze is down 31 feet below the 1500 level. The bottom is in porphyry and streaks of quartz yielding low assays.

UTAH.—The south drift from the bottom of the winze station has been extended 43 feet; total, 136 feet; this drift continues in a porphyry and quartz formation.

ENCHENQUER.—East crosscut on north line, 600 level, is out 261 feet; face in porphyry.

Hawthorne District.

LAPANTA.—Walker Lake Bulletin, July 15: The stope above the east drift No. 6 incline is turning out considerable high grade ore. Drifting east from winze below the 100-foot shaft level, at which point have a fine body of ore about 18 inches wide. Also sinking below the 100-foot shaft level at a point about 150 feet east of the shaft, showing good ore.

PAMLICO.—The only work during the week has been driving the main tunnel.

CENTRAL.—Sinking below the 150-foot level and stopping above the 75. Vein turning out well.

MOUNTAIN KING.—Have started drifting on the main ledge to the north on a strong vein about six feet wide, with a streak of high grade ore on the foot wall.

FAIRMOUNT.—During the week, track has been laid in the main drift and tunnel, and drifting ahead resumed. Ore showing in the winze below the tunnel. Ledge 10 inches wide and all high grade.

CAPITAL.—Still drifting for the ledge with every prospect of reaching it in a few days. Have encountered several very rich small pieces of antimonial silver ore.

HARTFORD.—Still sinking on ledge, producing lead and gold ore, ledge showing strong in bottom.

BEACON.—Stopes from incline still producing the usual amount of ore.

GOLD BAR.—South drift, Martinez tunnel level, has been extended 10 feet during the week. Ledge strong, and producing very rich ore.

IDA.—Still producing the usual amount of ore some of which is very high grade.

NEW YORK.—During the week the tunnel has been extended 10 feet, intersecting the parallel vein, upon which a drift has been started to the south.

Highland District.

CHLORIDE.—Pioche Record, July 16: The work of T. E. Edwards and William Lloyd at their Chloride mine is turning out nicely. The claim lies on the west side of the range about four miles from the brewery. Starting on an iron stain, a few feet led to iron ore carrying a good percentage of lead, which has now changed to carbonate ore heavy in lead carrying well in silver and at a depth of only eighteen feet. It is regarded as a very promising prospect and the present work will be continued.

ARIZONA.

TUNNEL.—Prescott Journal-Miner, July 15: The new tunnel being run to tap the Senator vein is now in about 300 feet. The mill continues to run successfully. Ferguson and Burmister's Jersey Lily mine is lying idle. This is a good gold property, and runs about \$50 in free gold. The vein is well defined, about 18 inches in thickness, and can be easily worked. The water has all been taken from the Silver Belt mine and the old workings have been thoroughly cleaned out and the work of taking out ore will be commenced to-morrow. Superintendent Clark brought in another fine large specimen of ore to-day from the mine. It will go away up in the thousands in silver. A new discovery has been made about two miles west of the old Railroad mine, Hassayampa district, by Burrows and Goff, two good miners and prospectors. The vein is in porphyry, carrying gold and silver, and averages about \$100 per ton, principally gold. They have started a tunnel on the vein, to determine its extent and richness. The main tunnel on Dan O'Boyle's Grayhound mine is now in about 80 feet, all in quartz and ore. The crosscut at the 50-foot level is finished and shows a 36-foot ledge. It is the intention of the owners to still push the tunnel until a depth of 250 feet shall be reached, when an east and west crosscut will be run to determine the extent of the ore body. This is a valuable piece of property, and will prove the merits of the big mines of the Hassayampa district, in which it is located. "Piute Dyke" is the name of a mineral vein or

dyke, situated about one and a-half miles below the Blue Dick, Hassayampa district, and is known by every old prospector in Yavapai Co. It has been located and relocated for years, but until lately nothing has been done on the property. About three months ago W. H. Ferguson and son made a discovery which proves that Yavapai Co. has merely been run over, and that close prospecting is all that is wanted to open up new and lasting dividend-paying mines. The ore is in silicate of iron, carrying a high grade of horn silver and chlorides. The main shaft is now down 40 feet, and has more than paid expenses. The vein at this depth is strong and well defined, and shows every indication of permanence. R. H. Burmister, who is interested with Mr. Ferguson, has men working on the property getting out shipping ore. Some assays go as high as 2,200 ounces in silver.

IDAHO.

DE LAMAR.—Nugget, July 16: Everything at the De Lamar mine and mill has run during the present month so smoothly and regularly that it leaves nothing to be said, further than repeating that everything is going on satisfactorily. Men are at work cribbing the creek and preparing foundations for the new 600 horse power Corliss engine for the improved mill. The new machinery for the mill will begin to arrive this week. New platform scales are being put in opposite the office to weigh freight arriving and shipping ore going out. Wm. Henderson and Frank St. Clair have located a claim just where the wagon road forks above Moss' fence, where the road turns up the hill going toward Jordan Valley. They have a large ledge showing on the surface, probably the connecting link between the mines at De Lamar and the new Cow creek discoveries. The wonder about all this is that such a ledge, and good flat scattered all around it, should not have been located years ago, as it is on a road which has been traveled for a quarter of a century. The very day it was located other parties discovered it was "just like the Twin Brothers' claim on Cow creek" and went there to locate it, only one hour too late.

MEADOW CREEK.—Alf. Sotheren was in the camp on Sunday from his Meadow creek claims, which he is prospecting with four men. He has located three claims on Bridge creek, all on the same ledge, which he says can be traced on the surface for fully a mile. He says the ledge is some three feet wide, one foot of which, by prospects made with a horn, shows good pay gold ore. Assays show the value of the bullion to be \$75 per ounce and very free milling. He feels confident, he will develop mines that will open up a new district, and that they will be in a country easy of access and where wood and water are abundant. A good many years ago rich float was found in this vicinity, and one placer mine has been worked right along every spring, and the impression has long prevailed that there were rich deposits there somewhere.

MONTANA.

ABOUT THE ANACONDA.—Inter-Mountain, July 15: Marcus Daly is expected home to-night. With his coming arise the numerous rumors and reports about the resumption of work at the Anaconda properties. There is no truth in the report that five carloads of oil had been ordered. In fact, nothing has transpired to show even the slightest change in the situation. If there is a man in the country who knows when work will resume that man is Mr. Daly and he keeps his own counsel. There is not the slightest indication that points to a resumption of work. All the railroad officials are in ignorance on the subject. Traffic Manager Donahue says he would be only too glad to announce that the mines would start up again, and said if he knew anything about it he would not keep back the good news. Business men no longer bother themselves about it. Trade is brisk in all lines, though some houses are carrying a good many people along. What the next few days may bring forth is not known and it is likely that some definite news may be given out, but as to this it is like everything else, mere guess work. Some work is being done at the mine. The engineers are at their posts daily, but all that is being done is keeping the mine clear of water.

STRIKE IN THE SOUTHERN CROSS.—It is reported that an important strike has been made in the Southern Cross. A force of men commenced breaking ore on the 150-foot level last week, preliminary to the commencement of shipments to Butte and Helena, and before driving west more than one or two sets came into a body of ore which is of higher grade than any heretofore shipped. It is said to sample about \$50 as an average of a 14-foot breast. It is, besides, of a very fine quality as an iron flux. Its importance to the stockholders, of course, depends on its extent, which can only be determined by the developments of the next week or two.

STRIKE IN THE GLENGARRY.—Inter-Mountain, July 18: Another strike is reported in the Glengarry in 350-foot level. The extent of the new find is not known yet to the company. Mr. Carney is going up this evening to investigate. It is reported, however, to be very rich. It is understood that O'Hara's mine, out at what is known as O'Hara's camp, in Jefferson county, is under bond to D. G. Bricker for \$40,000. Since the last report the following silver bar shipments have been made by the express companies:

	No. Bars.	Est'd Value.
Lexington ..	9	\$19,024
Alice ..	20	30,320
Bluebird ..	10	16,384
Moulton ..	8	11,702
Butte Bird ..	11	15,840
Totals ..	58	\$92,840

MINERS WANTED.—E. H. Schaffels writes us as follows from Sonora, Tolueme Co.: "Will you please notify the idle miners that at this time 25 good miners are wanted by the mines of Tolueme Co., at the Golden Gate mine. Men familiar with air compressors, power drills and shaft work are wanted in addition to miners. At the Keltz, Belle View and Eureka Co., miners are wanted. That class of men who need a fan or sunshade and food champagne are not wanted. Good reliable men can secure their \$3 a day. Board \$6 a week."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JULY 14, 1891.

- 455,917.—KNIFE-SHARPENER—J. S. Blood, Napa, Cal.
 456,018.—TONGUE SUPPORT—T. C. Churchman, Sacramento, Cal.
 455,997.—NOISELESS CHAMBER ATTACHMENT—Virginia M. Cone, Alameda, Cal.
 455,909.—BABY CARRIAGE—Davis & Dicks, San Jose, Cal.
 455,743.—WAVE MOTOR—R. B. Davy, San Diego, Cal.
 455,999.—DEVICE FOR OPERATING ENGINE INDICATORS—Jas. Gill, Portland, Or.
 456,129.—SASH-FASTENER—Axel Johnson, Oakland, Cal.
 456,039.—CAR-COUPLING—Jos. Kormil, Golden-dale, Wash.
 456,042.—ROLLING PIN, ETC.—Jane L. Landrith, Marshfield, Or.
 456,049.—PLIERS—W. J. Monteith, Albany, Or.
 455,858.—WINDMILL—Thos. Pepper, San Diego, Cal.
 456,057.—BALING PRESS—E. M. Pine, Puyallup, Wash.
 456,060.—ICE CREEPER—M. E. Reilly, Martesano, Wash.
 456,006.—STATION INDICATOR—W. T. Snedden, S. F.
 456,098.—STATION INDICATOR—G. H. Tietjen, S. F.
 455,914.—CULTIVATOR—J. V. Webster, Creston, Cal.

The following brief list, by telegraph, for July 21 will appear more complete upon receipt of mail advices: California—Chas. G. Ruthe, San Francisco, revolving cylinder engine; John T. Davis, treatment for coconut husks; Nathaniel T. Whiting, device for supplying water to vessels; Richard J. Crowley, Los Angeles, signaling apparatus; Axel Johnson, Oakland, sash balance; Delbert E. Barton, Alameda, clamp for attachment of cultivator teeth; Henry C. Fletcher, Oakland, valve for controlling mechanism for gas engines; William Mahoney, Santa Cruz, safety cap for powder kegs; John R. Woodward, Riverside, prop; John C. Calver, Calistoga, window cleaner; James McKenna, Martinez, feed cutter; George Allen and J. Landhofer, Auburn, vehicle tongue support; Charles W. Thompson, Tomales, gate; Zachariah W. Shields, Harrington, Wash., gunlock; Hewitt Wilbur, Ritzville, spring motor.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraph). American and Foreign patents obtained and general patent business for Pacific Coast inventor, transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CULTIVATOR.—Jonathan V. Webster, Creston, San Luis Obispo Co. No. 455,914. Dated July 14, 1891. The object of this invention is to so construct the frame and mount the teeth of the cultivator thereon, that these teeth will so stand with relation to each other, upon the different parts of the frame, that when the cultivator has passed over a surface of ground equal to its width, the teeth will have stirred and cultivated every portion of the ground so passed over. A further object, is to so construct the teeth of the cultivator, that they will present as little obstruction as possible, will cut up and loosen the soil, and may be made adjustable with relation to the line of travel, to suit the conditions under which they are to work. A combination of levers is adopted by which the whole of the frame-work, of the cultivator may be raised or depressed simultaneously without changing its plane of motion. The frame timbers are united so as to form a pentagon, having the angle or apex formed by the meeting of two timbers at the front. The arrangement of the timbers is such that the teeth on the outside timbers stand with relation to the line of travel so that each tooth stirs and cultivates the soil in a line which will just meet and overlap the line of the next adjacent tooth; and the rear tooth upon each of the outer timbers is in such a position with relation to the front tooth of each of the inner timbers that these latter just overlap and continue the track made by the outside teeth. Land-sides extending backward steady the machine and prevent it sliding. By this arrangement the whole of the soil from one side to the other for the complete width of the cultivator is thoroughly disturbed and agitated by once passing over the ground. A peculiar tooth is employed consisting of a broad thin blade of steel. The front edge of the shank of the tooth is heveled upon one side, this side being the one which will travel next to the land, and the attachment at the upper end of the shank is such that the shank and tooth may be turned with relation to the line of travel so as to be thrown a little to one side or the other of this line, so as to lessen the draft or give a greater or less turning capacity. The front edge of the shank is made so sharp that it will cut up soil of the hardest description. At the bottom, the shank is turned abruptly into a nearly horizontal position with reference to the vertical plane, but the rear portion is turned up slightly more than the front and is extended, so that it makes a triangular-shaped tooth having a beveled edge which is sharpened in the same manner as the front edge of the shank and in continuation of the same. By turning the shank of this cutter and adjusting it with relation to the line of travel the position of the foot or lower portion will be correspondingly changed and the cut will be varied to correspond. By means of a single lever the whole of the teeth of the cultivator may be correspondingly raised or depressed to vary the cut which they take in the soil. We have good reasons to believe the patentee has made a good invention that will render cultivation practicable to a wider range and extent than heretofore, and we hope in due time to present a pictorial view of the implement to our readers.

KNIFE AND SHEARS SHARPENER.—J. S. Blood, Napa. No. 455,917. Dated July 14, 1891. This is one of that class of sharpeners in which opposing

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Best & Belcher M Co., Nevada.....	49.....500.....	June 23, July 28, Aug 18.....	L. Osborn.....309 Montgomery St
Bullion M Co., Nevada.....	30.....500.....	July 16, Aug 20, Sept 8.....	R. R. Grayson.....331 Pine St
Chollar M Co., Nevada.....	30.....500.....	July 14, Aug 18, Sept 8.....	C. E. Elliott.....329 Montgomery St
Clara Cons M Co., S. Dakota.....	4.....250.....	June 2, July 20, Aug 16.....	A. Chumley.....303 California St
Cops Pacific M Co., California.....	13.....100.....	June 1, July 11, Aug 6.....	F. E. Luty.....310 Pine St
Crown Point M Co., Nevada.....	55.....500.....	July 9, Aug 13, Sept 3.....	J. Newlands.....331 Pine St
Evening Star M Co., California.....	2.....100.....	June 25, July 30, Aug 20.....	J. R. Scott.....320 Sansome St
Golden Jacket M Co., Nevada.....	4.....500.....	July 14, Aug 18, Sept 8.....	R. G. McCallan.....331 Montgomery St
Gray Eagle M Co., California.....	24.....300.....	June 9, July 14, Aug 4.....	A. W. Barrows.....132 California St
Inyo Marble Co., Nevada.....	13.....100.....	May 26, July 10, Aug 28.....	G. W. Luce.....313 California St
Justice M Co., Nevada.....	48.....250.....	July 11, Aug 15, Sept 4.....	R. E. Kelley.....419 California St
Manfred Spring M Co., California.....	20.....500.....	June 1, July 6, July 27.....	R. F. Motley.....419 California St
Mineral King M & Co., Arizona.....	8.....100.....	June 24, Aug 1, Aug 25.....	J. T. Norman.....309 Montgomery St
Northwestern L & M Co., Br. Columbia.....	3.....800.....	July 18, July 31, Aug 24.....	F. Bonanella.....438 California St
Potosi M Co., Nevada.....	35.....500.....	July 21, Aug 25, Sept 15.....	C. E. Elliott.....309 Montgomery St
Saratoga M Co., Nevada.....	1.....500.....	July 20, Aug 24, Aug 12.....	W. R. Drake.....119 California St
Savage M Co., Nevada.....	15.....500.....	July 16, Aug 19, Aug 12.....	E. R. Holmes.....309 Montgomery St
Seg Belcher & Miles Cons M Co., Nev.....	8.....250.....	June 16, July 20, Aug 10.....	E. R. Holmes.....309 Montgomery St
Silver King M Co., Arizona.....	6.....200.....	May 20, June 29, July 28.....	J. W. Pew.....310 Pine St
Telegraph Drift M Co., California.....	4.....6 mls.....	June 1, July 8, July 29.....	F. R. Wade.....Downville
Telegraph Cons M Co., California.....	6.....100.....	July 11, Sept 5.....	W. J. Gurnett.....308 Pine St
Teresa M Co., Mexico.....	4.....100.....	June 8, July 11, July 29.....	A. Chemant.....308 Pine St
Tuolumne Co. Development Co., Cal.....	7.....800.....	July 10, Aug 12, Aug 31.....	C. Hermann.....332 Kearney St
Valley View M Co., California.....	3.....500.....	June 16, July 20, Aug 10.....	W. J. Gurnett.....308 Pine St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Derbie Blue Gravel Co., California.....	T. Wetzel.....	320 Sansome St.....	Annual.....	Aug 4
Lady Washington M Co., Nevada.....	L. Osborn.....	309 Montgomery St.....	Annual.....	July 29
McHugh M Co., Nevada.....	P. O'Brien.....	328 Montgomery St.....	Annual.....	Aug 5
New York M Co.....	C. E. Elliott.....	309 Montgomery St.....	Annual.....	Aug 1
South Feather W & Union M Co., Cal.....	J. Coffin.....	220 California St.....	Annual.....	Aug 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co.....	T. Wetzel.....	320 Sansome St.....	10.....	June 15
Cons Cal & Virginia M Co., Nevada.....	A. W. Havens.....	309 Montgomery St.....	50.....	July 10
North Banner Cons M Co., California.....	T. J. Mitchell.....	Grass Valley.....	60.....	Aug 20
North Comstock M Co., Nevada.....	J. W. Few.....	308 Pine St.....	25.....	June 17
North Star M Co., California.....	D. A. Jennings.....	401 California St.....	50.....	Aug 1
Pacific Coast Borax Co., California.....	H. F. Clough.....	230 Montgomery St.....	1 00.....	July 10

polygonal steel plates are mounted upon a suitable handle, the blade of the instrument to be sharpened being drawn between the opposing edges of the plates. In this device the angle may be varied to suit different blades by turning the plate, and the angle between the two plates can be similarly varied to suit different thicknesses of knives. This peculiar shape of plates gives sixteen positions to sharpen knives by the turning of the plates and their reversal.

SASH-FASTENER.—Axel Johnson, Oakland, assignor to the Marshall Improved Window Furniture Co. of S. F. No. 456,129. Dated July 14, 1891.

This sash-fastener relates to that class in which a turning button in the window-sash acts to withdraw and to release a spring-controlled detent or pawl by which the locking is effected. The invention consists, in combination with this turning button, of an arm or piece projecting into the path of the button, whereby the latter, when the sash is moved, comes in contact with and is turned by the arm or piece, thereby automatically locking the sash. The object of the device is to provide for automatically locking the sash. This may take place when the sash is closed, so that the consequences of neglecting to lock it are avoided, or it may take place at any point in the movement of the sash, thereby serving as a safety device in case the sash should drop from from any cause.

Mining Share Market.

Comstock Mining Shares the past week, strengthened under more open buying by the pool, combined with some outside orders. There is no sign that the pool has sold any shares for at least a month past, but everything warrants the assertion that they bought. But as far as that is concerned, it is tasted in seemingly well informed quarters, that the pool has been concentrating certain stocks for many months past, with which they have not parted, even in the smallest way. Whether this concentrating means a small sized or large sized deal, the writer can not say, but all present moves warrant the assertion, that it will be one of the pure unadulterated good sized deals, after which, looting the mines, in which it is well known there are large bodies of high grade ore. It will take them many months to loot several of the mines. It now looks as if the pool will make the deal this fall with the shares of the North end mines, assisted largely by the Middle mines' shares, with the Gold Hill mines sympathizing, yet the present appearance of the market can and may be changed before the deal is over. In outside shares, dealing has been light, but the tone appears healthy. In the Bodies, Bodie has strengthened while Bulwer and Mono receded. The strength in Bodie is due to the bright promising condition of the mine and the stock being well in hand, yet well informed parties affirm that no decided improvement in the stock will be had, until after the levying of an assessment. Of course, this will be done to create the belief that most of the stock is out.

It is a remarkable feature of the history of the Comstock mines, that in nearly every instance when Sam Jones is appointed superintendent of a mine, that in some unaccountable manner the high grade ore and the certainty of a large body being uncovered as reported by his predecessor, dwindles down to nothing.

The Territorial Enterprise, July 21, says: Should pay ore in quantity be struck by the westerly workings of the Sierra Nevada, there would follow a general movement west along the line from the Utah to the Alta. If the Enterprise would show more enterprise and "dig up" mining records as published in its own columns years ago, it would find that several years ago high-grade ore was run in to the west in Sierra Nevada, but the shares of the mines were then and have been since so distributed as not to warrant its development.

It is questionable whether the rich ore reported by the superintendents about 12 years ago in some of the Gold Hill mines, and which were afterward flooded, will be developed for the benefit of outshareholders. No wonder big salaries are paid to some of the mine officials when it is considered how hard and wearisome must be the work to make ore, which goes over \$60 a ton, run a company in debt or, if not in debt, then barely keep even.

News from the Comstock mines is confirming that heretofore published in this department. They are now speaking more hopefully of the 1750-foot level in Con. Virginia, this level we have always claimed was where the true business lays, although one or more of the upper levels will play an im-

portant part in the coming deal. In Ophir and Best and Belcher developing work is being vigorously pushed. The ore lying to the west in Hale and Norcross and also in Savage, is proving to be high grade and of considerable size. If these mines were differently managed, outsiders would have more confidence in getting their money out of any ore found, perhaps it is part of the game not to inspire confidence. An ore development in Potosi and Bullion is being noised—perhaps they have a line of shorts, or else a line of stocks to sell, but ore can be shown in either mines whenever desired. In Seg. Belcher, Overman and the other Gold Hill mines the work is growing in interest. Overman's assays should steadily increase. In several of the mines whose shares sell for a trifle, quiet but important work is being done. From the outside mines, our advice are still of an encouraging character, confirming what has heretofore been published.

As if to verify our former statement regarding the west ledge of the Comstock, known as the Red Ledge, the northwest drift in the Sierra Nevada mine on its 630-foot level and at a distance of about 575 feet from the shaft, has passed through the syenite which was supposed to be the foot-wall of all the claims on the Comstock and the solid mountain itself, and has entered vein matter on the other side. This fact should be sufficient for all time and should forever dispel the theoretical error that there is but one ore-bearing vein known by the Comstock Lode. The west ledge is an established fact. Now then, gentlemen, go ahead and open up the continuation of this west vein in the Union, Mexican, Ophir, and West Con. Va. mines. This ledge is now definitely exposed in Sierra Nevada as well as West Con. Va. a distance of 2000 feet south of the Sierra Nevada. Then comes Savage. The east tunnel some 900 or more feet west of the shaft, has connected with the old Sinaloa shaft, and the said shaft is being sunk in the west ledge.

Woodbury Concentrators.

These machines are meeting with a success that must certainly be gratifying to the manufacturer, Mr. Geo. E. Woodbury. This week a reporter for the PRESS found him in the act of shipping one to Australia, with a prospect of sending several more in the same direction. In addition to this, Mr. Woodbury has, within 60 days, placed one near Marysville, three in Amador county, three in Leadville, Col., with 12 more ordered for the same State. Special machines are also being built for the tin ores of Temascal. The appended business letter expresses the general feeling with which the concentrators are regarded where they have been used and are known.

YANKEE BOY MINING CO., DURAY, COLO.,

June 15, 1891.
 GEO. E. WOODBURY, Esq., 213 First St., San Francisco.
 DEAR SIR:—Have been at mine nearly all the time, hence delay in answering your letter. Your concentrator is entirely satisfactory. Will instruct hook-keeper to send you check soon as our pay-day arrives (20th). Will write you more about your machine when I have time.

Very truly yours,
 F. M. ENDLICH.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. O. HOAG—San Francisco.
 J. C. BAILEY—San Francisco.
 GEO. WILSON—Sacramento Co.
 SAMUEL E. WATSON—Sonoma Co.
 HERNAN STANLEY—Modoc Co.
 C. J. WADE—San Bernardino Co.
 H. B. WEBSTER—Mendocino Co.
 W. S. FROESER—Ventura Co.
 CLAYTON A. DAYTON—Monterey Co.
 W. W. MILLER—Flumas Co.
 E. H. SCHARFLE—Central California.
 WM. M. HILLBARY—Oregon.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others,

MECHANICAL PROGRESS.

Power Without Fire or Steam.

The production of power without fire, steam or electricity would seem to be an absurdity—an impossibility; yet that is just what is claimed as an accomplished fact by one who is said to be a well-known inventor of New York city. The invention, if it is one, has been made public by a reporter of the New York *Herald*. The principle said to be involved in the invention is the ready control of certain forces similar in character to those which have long been used in explosives. Numerous attempts have been made to harness and render practical for ordinary power purposes the tremendous energy pent up in explosives. The gas engine, which is run by successive explosions of gas, is the only near approach to success which has hitherto been made in that direction. The utilization of the sudden and explosive expansion of water into steam has been attempted, but without success. We give the following for what it may be worth:

Our New York inventor claims to make use of explosive compounds in a liquid condition to accomplish his purpose. According to the *Herald* reporter, who claims to have been admitted quite fully into the secrets of the inventor, the perfected apparatus shows, in the first place, the reduction of the elementary explosive compounds, in proper proportions, to a certain fluid consistency, which fluid, by graduated motion, is fed into a chamber, from which, by its expansion, the power is obtained, and by its application to the common steam engine made to operate with the same effects as when run by steam.

True, says the inventor, the method is revolutionary, and at first thought, its successful operation might be considered altogether Utopian; but he claims that in his experiments, he has already passed the improbable line, and is simply perfecting his mechanism to demonstrate in the fullest manner the principles involved. He claims that this power can be handled quite as easily as steam, and with considerably less liability to accident. Elaborate drawings and working plans have been prepared, and inspection of them was afforded. Based upon these plans and a working model, the necessary steps have been taken to secure letters patent in all the principal countries of the world.

Said the inventor: "I propose to dispense with fire, coal and water and yet obtain all the power necessary."

"In the first place, my apparatus solves the street railway problem, for each car can be supplied with a simple mechanism whereby, with no overhead or underground wires, the motive-power to drive, heat, light and control the car may be obtained. Steamships may be run without boilers to generate steam; elevators can also be operated and steam and water dispensed with."

"Electric energy is procured by operating a dynamo, as by steam, and by the small cost many uses will be made possible, now debarred by the great expense of steam. The expense of the mechanism necessary will be from 200 to 500 per cent less than cost of a steam plant. In generating electricity, the cost is vastly reduced. The machine is practically automatic, and the power, heat and light derived, depend only on the will of the operator."

"The railroad locomotive will require no tender for the carriage of fuel; trains can be driven at high speed at minimum cost. Submarine vessels, now impracticable from lack of ability to store sufficient power, can be, when supplied with my apparatus, operated successfully. At will the sail yacht can be quickly converted into a swiftly driven propeller yacht."

How Can This Power be Produced?

"You know that you can by air expansion drive a wedge through a bar of iron; with powder you can send a 1000-ton rock or throw a projectile 12 miles. With nitro glycerine you can make an acre of land a yawning cavern; by means of gun-cotton a ship can be lifted out of the water, with Emmonzite a steel rail can be splintered; with Wetteren smokeless powder a velocity can be given to a shot of nearly 1900 feet per second, with an initial pressure of 47,000 pounds, using only 36 grains, and the projectile thrown 2½ miles. The powder used in rifle shells in the United States army causes bullets to reach a velocity of 1400 feet per second, with a pressure of 35,000."

"Now, suppose you acquire this power in reduced ratio, the minimum force is at command; graduate the force, bring it into subjection, and then you can comprehend the underlying principles of this new power producer."

"The machinery is arranged to prevent reflexible action, and no danger results in transmitting the force, which is procured from a combination of explosive ingredients which are at hand. In their manufacture, application and control lies the secret of my success."

"So accurately is the mechanism arranged that the ingredients, in almost fluid form, are fed into the first chamber of the machine, where ignition and expansion first takes place. Overrun of the fluid is impossible. After ignition the vapor, or ether, escapes through the vents to a low-pressure chamber attached—yet independent—where surplus force is utilized; the final residue escapes through a pipe into space."

A WONDERFUL MECHANICAL PROCESS.—The process of rolling railroad rails, of Bessemer steel, as practiced in Germany, is declared to be one of the most perfect mechanical operations in the world. The steel is cast in blocks which contain sufficient material for two or three rails, these blocks, while still red hot, being carried to the preparatory rolling mills by horses which have been trained to work in the midst of this fire and noise; here they are kept hot, in special furnaces, and are rolled into longer blocks having a square cross-section. After being thus prepared, they are taken to the rail rolling mills, which consist of two complete rolling mills, with all the appurtenances in one apartment, and the blocks which come from the preparatory mills are heated again and then passed between the rollers, of which there are three placed one above the other, so that the rails are rolled during the backward as well as the forward motion without requiring a change in the direction of rotation of the rollers. The rails have to pass back and forth between the rolls 13 or 14 times, and each time that they come from the rollers they are caught by the workmen on the short, bent ends of long levers which run on rollers on movable carriers. Each time the rail passes from between the rollers it is longer and its cross-section narrower than after the former rolling, until it finally stretches itself out like a gigantic fiery snake. It is then taken to a circular saw, which cuts through the glowing metal with perfect ease, dividing the long bar into two or three rails. The cold ring is now put under presses, by means of which the slightest irregularities are removed, and then the holes are bored, the end surfaces evened, etc.—*World's Progress*

A NEW PHASE IN STEELMAKING.—The first practical results of a new process of steelmaking have just been reached by the running of the first heat from a new experimental open-hearth furnace at the Sheffield Technical School. The process is the outcome of the researches of Prof. Arnold, and consists in removing all the impurities from Swedish pig iron with the exception of the exact proportion of carbon required for a given purpose, thus obtaining the ideal carbon and iron steel, homogeneous in structure and free from blowholes. These results are said to be obtained without the presence of more than mere traces of manganese and silicon, and also without the use of iron ore. The average time occupied by this process in the conversion of a ton of pig iron into the highest class of steel yet made will be about three hours, the fuel used consisting of about half a ton of rough slack. The run is stated to have been perfectly successful, the ingots showing a very high-quality steel. It is anticipated that the range of the metal produced will vary from what will be practically wrought iron to the hardest tool steel. The new furnace, together with the general plant, was designed to Prof. Arnold's specifications by Mr. B. H. Thwaite, C. E., and is intended to produce three tons of steel in the 24 hours.—*London Iron*.

BORING OUT GUNS.—Nearly all the inner tubes for modern rifle guns are bored out from the solid. The great Krupp gun recently made for the Russian Government, 44 feet long and weighing 135 tons, 16½ inches bore, was bored from the solid, with core bits, a tool like a crown saw or a diamond rock drill that cuts a thin groove around the core which is removed whole. In England a good many of these inner tubes are made of compressed steel, cast at the Whitworth works, but the main parts are bored. The first cut is a small hole of 1½ inch to three inches in diameter to guide the heavy tools, then a D bit follows, completing the bore to full size, less the finishing out.

MANY WILL BE SURPRISED to learn that the new metal aluminum must be annealed with great care, as it melts at almost a black heat, and has a little of the power action where a light heat is to be made use of. It is awful stuff to solder, but, strange to say, it has been welded to glass. However, there is nothing like getting used to a metal before all its uses are to be made known. At the price it is now quoted, it should be found on the market along with brass tubes and the like, where lightness of material is sought for.

THE WOOD VULCANIZING PROCESS seems to be rapidly commanding the notice which it so fairly deserves, if but a modicum of the claims made in its behalf are susceptible of actual demonstration. Wonderful results in heat-treating as well as curing all finished lumber are shown, and in addition to its preservative qualities, the merit claimed for it of exceptional cheapness should enlist the attention of the car-builders' trade particularly.

IRON VS. STEEL AXLES.—At a recent meeting of the North Railroad Club, London, England, Mr. George Dickson of the Great Northern railway read a paper on axles. His opinion is that the steel axle is cheaper than the iron, although, perhaps, not so safe. The failures of iron axles are less from breakage than from seamy defects, which are most apparent in the journal.

REPAIRING OF RAILS BY ELECTRICITY is said to be the inventor's latest achievement. The inventor proposes, first, to soften the metal by the passage of a great volume of current, and then, by means of a saw, cut out a defective portion. A sound piece of rail is then fitted into the gap and welded, electrically, into place.

SCIENTIFIC PROGRESS.

Improving the Phonograph.

Possibilities Which May Result Therefrom.

Efforts are being made, which it is thought may be successful, in so improving the phonograph that sounds which actually occur, but which are inaudible to the human ear, may, by the aid of the improved phonograph, become quite sensible to our auditory nerves. It is expected by this means to prove that even insects which are now supposed to be perfectly silent, shall be shown to have a voice or be capable of making their presence known by some mechanical sound—in fact that there is no such thing as absolutely dumb existence.

At first thought, says a contemporary, such an achievement seems altogether impossible. It does not seem credible that a sound so faint that it can make no impression on the human ear, could impress itself on the still coarser material that receives phonographic records. But science has recently advanced a new theory in relation to sound, and it is upon the truth of this theory, that the inventor bases his hopes of success. Sound is audible or inaudible to the human ear in proportion to the rapidity of the vibrations in the atmosphere that are started by the exciting cause. Up to a certain number of vibrations per second we are enabled to hear, but beyond this number our sensations are too slow and dull to receive impressions. Could the performers in a grand opera sing and play, in sufficiently fast tempo to exceed this number, the performance would seem to pass before our vision in dumb show.

Admitting the truth of this theory, which is also applied to vibrations of light, the limited number of vibrations enabling us to see objects and a greater number making us blind, it is hard to conjecture how the inventor hopes to compel his now inaudible insects to sing slow enough for his experiments. But if he can succeed in making a record of sounds inaudible to the ear, he may also open the way for the solution of still greater mysteries.

What, after all, is the mystery of Immortality, but a state of existence governed and made palpable by more active sensations than our own? Could we quicken our vibratory receptivity by so much as one octave—one octave of light and one octave of sound—we might possibly be enabled to look directly into the courts of the New Jerusalem, and to hear the angels sing, if they do sing. Can it be possible that the phonograph and the photograph combined will eventually place men in direct communication with our dear departed?

With such a possibility, our spiritualist friends must learn to be more scientific and more mechanical if they expect to bring conviction to this object-loving age. Of course, if the soul is immortal, there is a point somewhere where the visible and audible would step into the invisible and the inaudible, and we should be able to follow up the line theoretically, and to demonstrate it mechanically. But pianchette will not do. The now vanished Madam Dis Dabar will not do. Neither will any of the photographs of the departed that have been palmed off as the product of veritable sittings do. Neither will the asserted materialization of departed friends, who come so realistic, so warm and so plump with life and flesh, be any longer received as other than clever illusions palmed off upon us by deceiving mediums. If our lost friends have power to come to us with their natural voice, when asked by so-called mediums, they certainly ought to be able to communicate with us through the medium of the phonograph, if it is ever perfected to the extent hoped for by some of our enthusiastic inventors. But perhaps even then, we of this realistic age might not be willing to accept the evidence; unless they come armed with a certification from St. Peter, or some other equally reliable testimony as their condition and opportunities in the shadow land might enable them to produce.

RECENT RESEARCHES IN IRON FORMATIONS.—In a recent paper by Prof. Rucker, of England, allusion is made to the action of deep igneous rocks on the dipping needle, which he thinks must be ascribed to the metalliferous nature of those rocks, and as the latter must have come from below, they may, he thinks, be fairly held as supporting the theory of an internal metalliferous mass. A further point is also made in this connection, that, in the meteorites which occasionally visit the earth, a common constituent is metallic iron, often so pure as to admit of its taking on a brilliant polish. It being a fact, therefore, that such iron exists in some extraterrestrial sphere, giving rise to those meteoric visitants, there is surely no reason, it is argued, why the metal should not exist in this state on the earth, and, seeing it is not found at or near the surface in such condition, metallic or native, the only other place it can be in is deeper down, or, in point of fact, in an internal mass. It is well understood, from various independent observations and calculations, that the specific gravity of the earth as a whole is about 5.5, while the average of rocks at the surface is rather under half this amount; and, while some have assumed that the increased specific gravity is obtained by excess of pressure, it is more generally considered—from the abundance of iron compounds in the crust and its apparent derivation from the igneous rocks, together with the suitability of its specific gravity for balancing up the

deficiency in the surface rocks—that an immense store of metallo iron exists in the earth at a certain depth, not yet determined.

THE COSMICAL TELEPHONE.—A correspondent of the *Scientific American* questions the possibility of Edison's cosmic telephone by which he hopes to hear sounds resulting from solar causes, because it is pretty well established that sound cannot travel without a medium, either solid, liquid or gaseous. So far as is known there is no medium between the earth and the sun beyond the limits of the terrestrial shallow atmosphere capable of transmitting sound waves, and until it is shown that such medium exists, the theory of inter-solar transmission of sound will not find ready acceptance among physicists. The strange sounds heard by Mr. Edison, as he states, while experimenting with the long distance telephone, if cosmic at all, were, it would seem, much more likely to have been of seismic origin. Furthermore, judging by present knowledge as to the rate of sound transmission, there could not have been any connection between the sounds heard and the observed sun spots, for if Mr. Edison, as he sneeps, really heard sounds from the sun, the cause that produced them must have taken place more than thirteen years before they could have reached the earth, unless it be proved that sound may be transmitted by radiant electricity or some other equally rapid agent. The correspondent adds that although Mr. Edison's experiments may result in important discovery, still at present it seems hardly probable that he will be able to hear the roar and crash of solar tempests, as inviting as the thought may be.

SANITARY SCIENCE.—Sanitary science, says the *Sanitary News*, is a science that does not relate to the earth we live on or to the heavens we live under, but to the conditions of the homes we live in. We can live on the earth or under the heavens without knowing much about them, but to live best in our homes we must know them well. Geology cannot change the conditions of the earth beneath us, or astronomy those of the heavens above us, but sanitary science can change from unhealthy to healthy the conditions of the homes we live in. Is it not then a science worthy of study? It touches the highest interests of mankind, cleanses and purifies the present generation, and will strengthen and will glorify posterity. The effects of obedience to its laws are not remote but immediate. They touch the everyday life of all, and enter into all the relations of life. They give strength and vigor to whatever capacity in which human endeavor is put forth.

THE DISCOVERY AND UTILITY OF THE GLASS LAMP-CHIMNEY.—Lamp glasses were invented by Alime Argand, the inventor of the famous lamp and gas burner which bear his name. He had been experimenting for some time in trying to loosen the light, but to no purpose. On the table before him lay the broken neck of an oil flask. This he took up carelessly and placed it, almost without thought, over the wick. A brilliant flame was the result, and the hint was not lost upon the experimentalist, who proceeded to put his discovery into practical operation at once. The chimney has the effect of heightening the light of a lamp because it increases the supply of oxygen to the flame by producing a draft, and concentrates and reflects the heat of the flame, in consequence of which the combustion of the carbon is more perfect and very little escapes unconsumed.

CRYSTALS OF PLATINUM.—Professor Joly has found that crystals of platinum and palladium are easily prepared as follows: A ribbon of pure metal is stretched horizontally between two binding screws. On the ribbon finely powdered topez is dusted, and an electric current passed through the ribbon of a strength sufficient to raise it to a bright red heat. In about half an hour, on examining the ribbon with a microscope, it will be found that very small, brilliant crystals cling here and there to projecting points of the partially decomposed topez. If the heat be maintained these crystals steadily grow, and in about two hours' time some will have attained to a size of about 0.1 mm. The crystals are opaque, and show a high metallic lustre, like that of clean mercury, but are somewhat whiter in color.

LORD SALISBURY is quite a distinguished savant as well as a renowned statesman. In a recent lecture before the Chemical Society of London, he said: "Astronomy is, in a great measure, the science of things as they probably are, geology is the science of things as they probably were, chemistry is the science of things as they are at present." To these adds the *Electrical Engineer*, "Electricity is the science of things as they probably will be."

At the depth of about 3500 feet, the temperature of the ocean is about the same, varying only a trifle, from the polar latitudes to the equator.

When Herschel studied astronomy only four double stars were known. Now nearly 7000 of them are distinguishable.

The Oakland Board of Trade has agreed to pay the electric railway company, which is to build to Haywards, a bonus of \$10,000 when the road is continued in to Broadway, Oakland.

ELECTRICITY.

Wonders of Electricity.

Incandescent Lighting With Only One Wire, and Lighting Without Any.

Something of what may ultimately be expected of electricity was demonstrated to the American Institute of Electrical Engineers at Columbia College, recently, by an electrician named Nikola Tesla. The experiments were in the line of the application of electricity to lighting, and Mr. Tesla showed that the best of the present methods can scarcely be considered as ranking with the A B O of the science as it manifestly will be understood and applied. He showed that incandescent lights can be fed with a single wire, that it is not necessary to provide a "dronit" for the electricity, but that lamps may be located at the end of a wire, and he showed that instead of the delicate and easily destroyed carbon filament now used for incandescent lamps a solid block of carbon that will last for an indefinite time may be employed.

This showing with reference to incandescent lighting sweeps away a large proportion of the expense of the system as it is now operated, and gives ample foundation for expectation, that the electric light will soon become the cheapest, as it is the best, light for common use in houses.

If this experimenter had stopped with his substitution of one wire for two, and his block of carbon for the carbon filament, his discovery would have been regarded as one of the most wonderful and useful of all the great electric inventions. But he did not stop there. He went much further, and demonstrated that electric lighting of rooms is possible without the use of any lamp. He showed that a room can be brilliantly lighted by electricity by placing on opposite walls sheets of zinc connected with electric wires and hanging anywhere between these sheets a glass tube from which the air has been exhausted. The plates create an electrostatic field, and the glass tube will produce the light anywhere within that field.

What the secret of Mr. Tesla's discovery is he did not reveal, but it appears that he transforms a powerful dynamic current of electricity into a static current at the point of utilization, which is something electricians had not previously been able to do. These experiments have attracted the attention of the most expert electricians in this country and Europe, and they anticipate more wonderful results than have yet been announced.

EDISON'S KINETOGRAPH.—Mr. Edison seems to be likely to meet with a serious impediment in the way of his enjoying either the honor or the profits of his "kinetograph" invention. It now appears that the originality of Edison's embryo invention of the "kinetograph," is controverted by a Mr. Rudge, of Bath, England, who, according to the London *Electrical Engineer*, "has prior claims which will hardly be disputed. Mr. Rudge has quite recently perfected an electrical arrangement which greatly assists in giving a faithful reproduction upon a screen of what we may term continuity of action. By means also of an optical arrangement not generally known, Mr. Rudge is able to project upon the screen a series of pictures in which the action seems continuous from one point to another. The eyeside seem to move, or the lips, or the arms, or whatever part of the body is in motion."

DEMAND FOR ELECTRIC MOTORS.—The demand for stationary electric motors is something enormous, and one firm, having headquarters at New York, reports that it is 2000 motors behind orders already received, and that other orders are pouring in from all sections of the country. The motors are used for all sorts of purposes, from the beating of carpets to the chopping up of sausage meat. A large number of orders are received every week from printers, and it is estimated that at least 200 newspapers are printed by presses run by electricity while thousands of job offices have discarded steam power for the new and compact motor.

THE SAN FRANCISCO AND SAN MATEO CONSTRUCTION CO., which is building the electric road to Redwood City from San Francisco, has bought land for its power house on the Sunnyvale tract, close to the San Jose road, about midway between the Market street ferries and the county line. The crossings of the electric road with the other car-lines of the city are now being put in.

AN ELECTRIC GUN.—A gun operated by electricity is a recent invention of Edward A. Hyde of Kenosha, Wis., who claims that guns made of paper or wood, and operated by his system, would be effective at long range.

THE NEW ELECTRIC RAILWAY running from Asheville to Rutherfordton, N. C., will be 41 miles long, and probably the longest in the country. Both passenger and freight cars will be operated.

LONG DISTANCE TELEPHONES.—Arrangements have been made for the erection of a telephone wire between Paris, Nancy and Epinal. Nancy is about 190 miles and Epinal 225 miles from Paris.

AN ELECTRIC TYPEWRITER is said to have been invented by a Philadelphian, by means of

which the operator can transmit his typewritten manuscript hundreds of miles.

NOW AND THEN.—Only a few years ago Edison was working for a modest salary. His income at the present time from various sources is said to be \$100,000 annually.

GOOD HEALTH.

Music as a Mental Tonic.

Its Value in the Treatment of Disease—Effect of a Pleading Melody.

The value of music as a therapeutic cannot yet be precisely stated. Of its wholesome influence in various forms of disease, however, there can be little or no doubt, says the London *Lancet*. In making this assertion, we do not, of course, assign to it any specific or peculiar action. It is no quack's nostrum, no reputed conqueror of ache or ailment. It is only, as we have already shown in a recent article, one of those intangible but effective aids of medicine which exert their healthful properties through the nervous system. It is as a mental tonic that music acts. Accordingly we may naturally expect it to exert its powers chiefly in those diseases, or aspects of disease, which are due to morbid nervous action. The evidence of its utility on occasions where fatigue or worry has disturbed the proper balance and relation between the mind and body of the so-called healthy, will explain its action in disease. We can readily understand how a pleasing and lively melody can awake in a jaded brain the strong emotion of hope, and energizing by its means the languid nerve control of the whole circulation, strengthen the heart-beat and refresh the vascularity of every organ. We can picture the same brain in forced irritation fretfully stimulating the service of the vasomotor nerves, and starving the tissues of their blood supply. Here, again, it is easy to comprehend the regulating effect of quieter harmony, which brings at once a rest and a diversion of the fretting mind. Even aches are soothed for a time by a transference of attention, and why, then, should not pain be lulled by music? That it sometimes is thus relieved we can have no doubt. It is especially in the graver nervous maladies, however, that we should look for benefit from this remedy. Definite statistics on the subject may not yet be forthcoming, but all that we have said goes to show that states of insanity, which are largely influenced by the condition of the sympathetic system, should find some part of their treatment in the hands of the musician. It is, therefore, for such cases especially that we would enlist his services.

A New Theory of La Grippe.

The unaccountable nature of the influenza commonly known as the gripe, has invited the theories of all sorts and conditions of men, not to say of doctors, but among all no one is, perhaps, so well calculated to commend itself to confidence as that of Sir Morell Mackenzie, M. D., who in a paper in the June *Fortnightly*, asserts that in his opinion, "the riddle of influenza is poisoned nerves," and from this hypothesis, "the bewildering diversity of symptoms becomes intelligible, if we regard them as the results of disordered nervous action." Dr. Mackenzie compares it to the extraordinary disturbance in telegraphic systems produced by a thunderstorm, and says this is nothing "compared with the freaks played by the living conductors in the human body, if anything throws the governing centers out of gear."

Now the theory of "poisoned nerves" is one that explains the almost infinite variety of attacks and curious freaks that mark the disease. No two persons, it is safe to say, have ever experienced precisely the same symptoms, and if it is a nervous disturbance, this is the natural result. Dr. Mackenzie regards the epidemic as falling under three general types, each of which include many varieties; these are the catarrhal, the digestive and the nervous. "Influenza," he says, "is the very Proteus of diseases, a malady which assumes so many forms that it seems to be not one, but an epitome of all diseases, and its symptomatology includes almost everything, from a cold in the head to inflammation of the brain. . . . It is really an acute specific fever, running a definite course like measles or scarlatina. . . . It is a disease with that superficial complexity of aspect which made Mrs. Carlyle playfully suggest that the doctors had agreed to call half a dozen different diseases by one name in order to simplify treatment."

Dr. Mackenzie adds that under all its disguises, he believes the disease to be perfectly simple; that the profound impression made on the nervous system by the poison, explains nearly all the after effects of the malady, and especially that curious loss of vital energy, which is so disproportionately great in comparison with the disease itself. The cause Dr. Mackenzie believes to be a living germ, airborne, but of what nature is not yet, he believes established.

RELIABLE STATISTICS show that the percentage of insanity among farmers' wives is greater than in any other class. The explanation is they work too hard, are left alone too much, and have too little chance to take recreation and enjoy society.

ENGINEERING NOTES.

Jet Propulsion.

The idea of propelling ships by jet propulsion seems to be attracting much attention just at this time, and quite a number of apparently valuable suggestions have been made to aid in reaching a successful solution of the problem.

One writer in the *Scientific American* suggests that "in order to make the jet effective a large volume of water must be handled and thrust with a relatively low pressure and velocity against that which is to resist its motion. It requires but little calculation to show that the pressure, per square inch, on the paddles of a steamboat wheel is slight, in most cases not more than from two to four pounds. The buckets are moved at a velocity of 30 to 50 feet per second, or only a little more than double the speed of the boat. With these figures as foot-pounds, it is plainly seen that a large volume of water must be moved under like pressure and speed in order that the power may be absorbed which is used for steamship propulsion."

Another writer in the same journal suggests that "thrusts from a jet pipe made to act intermittently might produce greater propulsion results than a constant jet, which tends more to bore a hole in the resisting element."

Another suggests the use of the air to act as a sort of lubricant between the water and hull of a steamship, and thus increase the speed of a vessel, or lessen the power necessary to propel it. This has already been made the subject of a patent, and although it should not be regarded as related to jet propulsion, any further than as an aid thereto, it is nevertheless indexed in the patent office under that head.

A Brooklyn (N. Y.) engineer, Alexander Vogelaang, thinks the real loss in all jet propulsion has been—that as the direction of the jet has always been in a straight line in an opposite direction to the vessel's way, the jet cannot find a fulcrum close to the discharge to act against, except the peripheral part of said jet. It has occurred to him to use two or more jets, the nozzles pointing in an opposite direction to the vessel's way, and to make these jets revolve around a common axis in circular paths like the tips of a screw propeller. The object was not to allow the jet time to give velocity to the water acted upon and so to find a solid fulcrum for the entire area of the jet close to the discharge.

J. Barkitt Webb, at a late meeting of the New York Society of Mechanical Engineers, said that the subject of jet propulsion was one which is not ordinarily well understood.

Experiments had been made to prove that the reaction of a jet is the same in air as in water, to disprove a statement that a stream of water issuing from a nozzle under water reacts upon the surrounding water and tends to drive the nozzle in the opposite direction to that of the jet in the same way that a solid rod, issuing from the nozzle, would react upon a stone wall.

The tests were made in a large tank, and the water was supplied by a steam pump at a constant pressure of 100 pounds per square inch.

The nozzle was fastened to the foot of a pendulum four feet long and connected to the pump by a flexible half-inch rubber hose. The hose was hung by strings so that the stiffness was inappreciable. The pendulum at the nozzle was connected to a spring balance by a cord about four feet long. When the jet was flowing, the pendulum was brought to the vertical by moving the balance, and in this way every force due to the deflection of the pendulum was eliminated.

The pendulum was first hung so that the nozzle was a little above the water and the reaction found to be four pounds. The pendulum was then lowered so that the nozzle was about four inches below the surface of the water, all other conditions being the same, and the reaction was found to be the same—four pounds. The only difference was that when the nozzle was under water, the balance hand vibrated a little more.

Still, the general verdict of engineers is against the jet method of propulsion. Yet such verdict does not prove that the principle is wrong, or that it may not eventually be made a success. Let the principle be right or wrong, the community at large is in sympathy with it, and is living in hopes that both screws and paddle-wheels, that so uncomfortably chain up the ocean and jar the vessel to the discomfort of passengers, will eventually have to give way to the gentle and smooth action of jet propulsion.

A DIFFICULT ENGINEERING PROBLEM.—One of the most intricate, if not difficult, problems which Engineer Mantou of this city has of late had to contend with is a satisfactory solution as to how to most conveniently handle the large passenger traffic which is constantly crowding the foot of Market street in this city, seeking a safe passage to the various ferry steamers to Oakland, Alameda and Sausalito. How to move, with safety to the great crowd of foot passengers, the numerous street cars, which average fully one to every minute, is quite a perplexing problem. After many days, however, it seems to have been settled quite satisfactorily to all parties interested.

In the early days of steamships on the Atlantic, the steam pressure carried was five

pounds only, above the atmosphere, and the engines made from 10 to 12 revolutions per minute; the vessels made 8 knots per hour on an average. Now we carry exactly 36 times the pressure, make 7 times the revolutions, but go only 2½ times faster.

USEFUL INFORMATION.

Improved Mortar.

As the result of a long series of investigations, as well as practical tests, Prof. Baker, of Illinois, finds that a superior mortar, and remarkably non-absorbent, is obtainable by the addition of alum and potash soap. In this case, one per cent by weight of powdered alum is added to the dry cement and sand, the mixture being most thorough, and about one per cent of any potash soap—say ordinary soft soap made from wood ashes—is dissolved in the water used for mixing the mortar; the alum and soap combine and form compounds of alumina and fatty acids, which are insoluble in water, these compounds not being acted upon by the carbonic acid of the air, and adding considerably to the early strength of the mortar. With lime mortar the alum and soap have a slight disadvantage, in that the compounds which render the mortar impervious to water, prevent also the air from coming in contact with the lime, and consequently prevent the setting of the mortar, while, on the other hand, the alum and soap compounds add materially to both the early and ultimate strength of the article. As an evidence of the efficiency of such a compound, the fact is stated that the walls of the great Croton reservoir, in Central Park, New York, were rendered impervious by simply washing them four times alternately with alum and the soap solutions, the walls previously allowing the water to pass freely, it being also found that four coatings, that is, two pairs, render an ordinary brick absolutely impervious, even under a 40-foot head of water.

BURNING SMOKE is not such a modern idea as many suppose. In a book on the steam engine, printed more than 60 years ago, is the following: "There are cases in which it is of advantage to burn the smoke that issues from furnaces. As, however, when the fire is properly managed but little unconsumed matter will issue from a furnace of the ordinary construction, such plans are of very little value in making the heat produced by a given quantity of fuel greater. It is only then, when the smoke that occasionally issues when fuel is just added is productive of inconvenience to the neighborhood that furnaces of the kind [for burning smoke] need be erected."

CALIFORNIA DYES.—A new industry in the line of dyes is becoming of considerable importance to California. Lower California has long been noted for the variety of dyes which it produces, such as orchilla weed, etc., but the torotee tree bark, recently discovered, has come into great demand, and several large shiploads have been exported to Europe. As yet there seems to be but little demand for the article in the United States, although it is cheaper than orchilla and other dyes, producing in its natural state a dark red color, which is quite indelible. It is now collected and sold in this market at the price of \$1 to \$1.50 per 100 pounds, and the supply seems to be enormous.

A SIMPLE SUBSTITUTE FOR SEIDLITZ POWDERS.—A simple "foam," answering the same purpose as seidlitz powders, can readily be made at home. Take half a tumbler of cold water sweeten to taste and add enough vinegar to make it quite tart, about three or four teaspoonfuls, and none but pure older vinegar or that made from syrups should be used. Take another tumbler, put in three tablespoonfuls of water, dissolve in it a third of an even teaspoonful of soda, or sufficient to neutralize the vinegar; pour the two mixtures together, stir until it begins to foam, then drink quickly. You find it will make a pleasant beverage.

PLASTER OF PARIS.—It is said that from two to four per cent of powdered marshmallow root, mixed with plaster of Paris, makes it set more slowly, and so greatly increases its hardness when it has set, that it can be sawn, filed, and turned in the lathe. Eight per cent of the powdered root will retard the setting for an hour.

CELLULOSE is stated by the *Optician* to be totally unfit for articles requiring mathematical precision, although it can be put to many other uses. Its propensity to warp is far in excess of that of wood.

Two coats of boiled linseed oil makes the best varnish for new copper work. The first coat should be thoroughly dry before the second one is put on.

CORKS steeped in vaseline are excellent substitutes for glass stoppers. They are not affected by acids, and never become fixed through disuse.

ISINGLASS boiled in spirits of wine will produce a transparent cement which will unite broken glass so as to render the factor almost imperceptible.

ELECTRIC WANDS are now used in beating taming.



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SAN FRANCISCO:

Saturday, July 25, 1891.

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Passing Events.

Gold mining excitements in three widely separated localities are reported this week. Placer mines near Bluefields, Nicaragua; quartz at Pine Nut, Nevada; and placers and quartz not far from Ellensburg, Washington, have each created great interest among prospectors in the respective regions.

Up on the Comstock, the people are more interested just at this time in pumping operations to free the lower levels of water than they are in prospecting new ground. Great hopes are entertained of what will be developed in the deeper ground of the various mines on the lode.

The iron-ore deposits of the coast are commencing to attract some attention. There are many of them, but few have been utilized. Those of Oregon and Washington have the advantage of fuel near by, while we have no good coals in California suitable for working iron. The works to be established in San Diego are looked to with great interest, since if they are successful, others will be built at other points.

GOLD IN WASHINGTON.—A dispatch from Ellensburg, Wash., states that there is great excitement over the gold finds in Menatash canyon, 15 miles from there. Many prospectors are starting for the fields.

THE Powder companies are getting plenty of nitrate from Chile, although there was a fear at one time that there would be difficulty about it. Ships go from here loaded with provisions and return with cargoes of nitrate.

Local Manufactures.

We published last week the assessor's list of manufacturing establishments in this city. The number of these, according to the assessor's report, was 996, while the census of ten years ago gave the number of local manufactories as 2971. Comparing these figures, there is apparently a great falling off in local manufactures. But the fact is, there are 4182 factories of various kinds here, as we find from the figures of the local census agent. This latter official had 15 men at work for five months, and he finds the actual condition as follows: Number of establishments, 4182; number of hands employed, 40,000; total annual value of product, \$143,000,000. The assessors figures for the same year show 27,570 hands and \$103,310,600 product.

Of course the census agent's work was thoroughly done and that of the assessor was only incidental. The census included every factory or place where any product was made, while the assessor ignored small establishments run in the rear of stores, in dwellings and rooms. But the variance in the figures shows that a number of small factories greatly increases the number of hands employed, and increases by nearly one-half the total value of the annual product.

We find then that 4182 factories employ 40,000 hands and produce \$140,000,000 annually. This state of affairs will give San Francisco a good standing among the manufacturing cities of the Union. The previous census gave it a high rating, and its percentage of increase for the last census should raise it still higher in the scale.

While we have not the advantage of densely populated contiguous territory, or numerous competing railroads, as have some large Eastern cities, yet the standing of San Francisco as a manufacturing point is satisfactory. We shall await with interest the publication of the details of the census report on manufactures, so that this point may be compared with others.

Large Hoisting Engines.

The illustration on page 49 shows one of the late designs in hoisting engines, manufactured by the Edward P. Allis Company, Milwaukee, Wis. This hoist was made for the Tamarack Mining Co., Opechee, Michigan. The drum on this special machine is 30 feet in diameter by 11 feet face. The steam cylinders are 42 inches diameter by 84 inches stroke. Both cylinders have Corliss valves with Reynolds' automatic cut-off. This gear is so attached that the cut-offs are inoperative when the engines are starting a load or moving slow, but they can be instantly applied at any time by the operator, and by their use perform a given amount of work with an appreciable saving in steam and fuel.

The valve gear is driven by a lay shaft located alongside the engine frame and operated by gears from the drum shaft; to it is attached the steam reversing gear of a novel design and simple form. A brake band is located at each end of the drum; these bands are operated by a patent steam and gravity gear, by which arrangement the brake pressure can be varied as required, and the brake always applied, even though the steam supply to the engine should be cut off.

All levers for handling the engine in either direction and operating the brake mechanism are located on a raised platform near to the miniatures which show the location of the skips or cages in the mine shaft.

The manufacturers can change the sizes of the cylinders and rope drum to fit the requirements of any mine, and preserve the general plan as shown by the illustration.

MINING LAWS.—Stewart's Mining bill only passed one branch of Congress, last session, so did not become a law. So there is no change in the time or date for annual assessment work. The Stewart bill would have changed the date, but as stated, it did not become a law. The Government mining laws are to-day just the same as they have been for some years past. This has previously been stated in the PRESS, but the question is repeatedly asked by miners who think the date for assessment work has been changed. It has not.

THE Morning Star drift gravel mine is paying dividends of \$2.50 per share on 2400 shares. The mine will soon be run night and day.

Reduction Works Wanted.

There are miners in Northern Arizona who honestly believe that railroad people do not care to see general quartz reduction works at Kingman, Mohave county, and Prescott, Yavapai county, the mining centers of the section. We have sometimes thought that way, too. The idea appears to be that the railroads, especially the long ones, believe that the starting of reduction works would lessen freight—deprive it of business.

This, miners and others deny. We deny it. Were these first-class works in this section miners could handle ores of less value than are now handled. Thousands instead of hundreds of tons of ores would be mined and worked; miners and others would be more numerous and the roads would profit by the change or changes. The miners and the Courier may be mistaken in these matters, but we doubt it. Think of this business, Messrs. Railroad Managers.—Prescott (A. T.), Courier.

This opinion bears out the remarks made on the subject in the MINING AND SCIENTIFIC PRESS of last week. Quartz reduction works are needed at all the mining centers of this coast, and they would be operated with profit were it possible to obtain the ores from the various camps at reasonable rates. There is plenty of ore and there would be more, but under the present condition very little, comparatively, is shipped. The ordinary low-grade ores will not bear shipment with high freight charges.

As we stated last week, some of the roads have built up an extensive ore business by placing the charges low enough to encourage mining development. This has been the means also of building up extensive reduction works at points on these roads. The railroads in California, Nevada and Arizona have pursued a different policy, and have given no encouragement to the mining communities. Poor ore cannot be shipped, and the richer the ore, the higher the freight charges.

It is in the power of these roads to create a demand for ores at reduction centers; to establish reduction centers, and to build up the mining camps. But thus far they have shown no liberal disposition. It is our belief, based on the experience of interior lines of roads, that a more liberal system of charges would, in the end, redound to the benefit of the roads as well as to the miners.

It is not, as we have previously stated, the city of San Francisco alone, which would derive benefit from more reduction works, but such places as Kingman, Prescott, and others. They would all get more or less business which the miners would send them. There are hundreds of miners owning claims which would be profitable if the ores could be shipped to a distance. But most ores will not pay when excessive freight charges are added to the cost of mining and reduction. The freight is often higher than the other two combined; as a result the mining industry languishes. It is to be hoped that the railroad people will give this subject an exhaustive examination and afford some relief from present conditions.

Hydraulic Mining Conference.

A number of citizens of Iowa Hill, Placer county have, through a committee petitioned the Sacramento county Supervisors, to withhold its proposed action to procure permanent injunctions against the Iowa Hill mines, until they make a personal examination. A number of business men of Sacramento also presented a petition asking the supervisors to pay heed to the Iowa Hill petition, and visit the mines so as to act advisedly.

It will be remembered that once before an Iowa Hill mine was enjoined through a misrepresentation of facts, and when the Supervisors personally viewed the premises they caused the injunction to be removed.

The Iowa Hill petition sets forth that the local supply of water is very limited and the periods within which the several companies are engaged in hydraulic mining does not exceed 60 days each season, and that the gravel is coarse and cemented so but a small quantity can be removed. Among other reasons advanced are the following:

That the gravel and debris from the said hydraulic mining flows into Indian canyon, a tributary of the North Fork of the American river, and is deposited in said canyon at a point about seven miles above the junction of said river. The said canyon, having a very light grade, nearly all of said gravel and debris so deposited in said canyon remains there indefinitely, not affected by any winter freshets, as the head and source of said canyon being but about four miles above the point of said deposit, the area of drainage into the same is very small; and as most of the heavy storms are accompanied with snow at the head of said

canyon, which, within a mile of the head, rises quite abruptly to an altitude of about 1200 feet above the point of deposit of said gravel and debris therein, the accumulated water does not have any material effect in the removal of said gravel and debris from said canyon.

That the hydraulic mines in this section have of late years been worked in a limited manner with small heads of water and but a short period of time each season, the gravel being coarse and heavy (the lighter deposits having been previously removed) the gravel remaining is small in quantity, and of such a character that the damage to arise from the working and mining the same would not be appreciable.

That there is a considerable area of bedrock in the several mines covered with heavy, coarse gravel of a depth of from two to ten feet which contains considerable gold, and which could be mined off without causing damage to any party or parties situated below.

The petition concludes as follows: Wherefore, in view that the matter at issue may be fully understood and may be adjusted without resorting to expensive and vexatious litigation, we would earnestly and respectfully request that your honorable body visit this place at the earliest moment practicable, and by personal observation and inquiry inform yourselves of all the facts relating thereto, to the end that the order enjoining the mines of this section from working be dismissed or modified, as from a full knowledge of the attending circumstances may to your honorable body seem meet and proper.

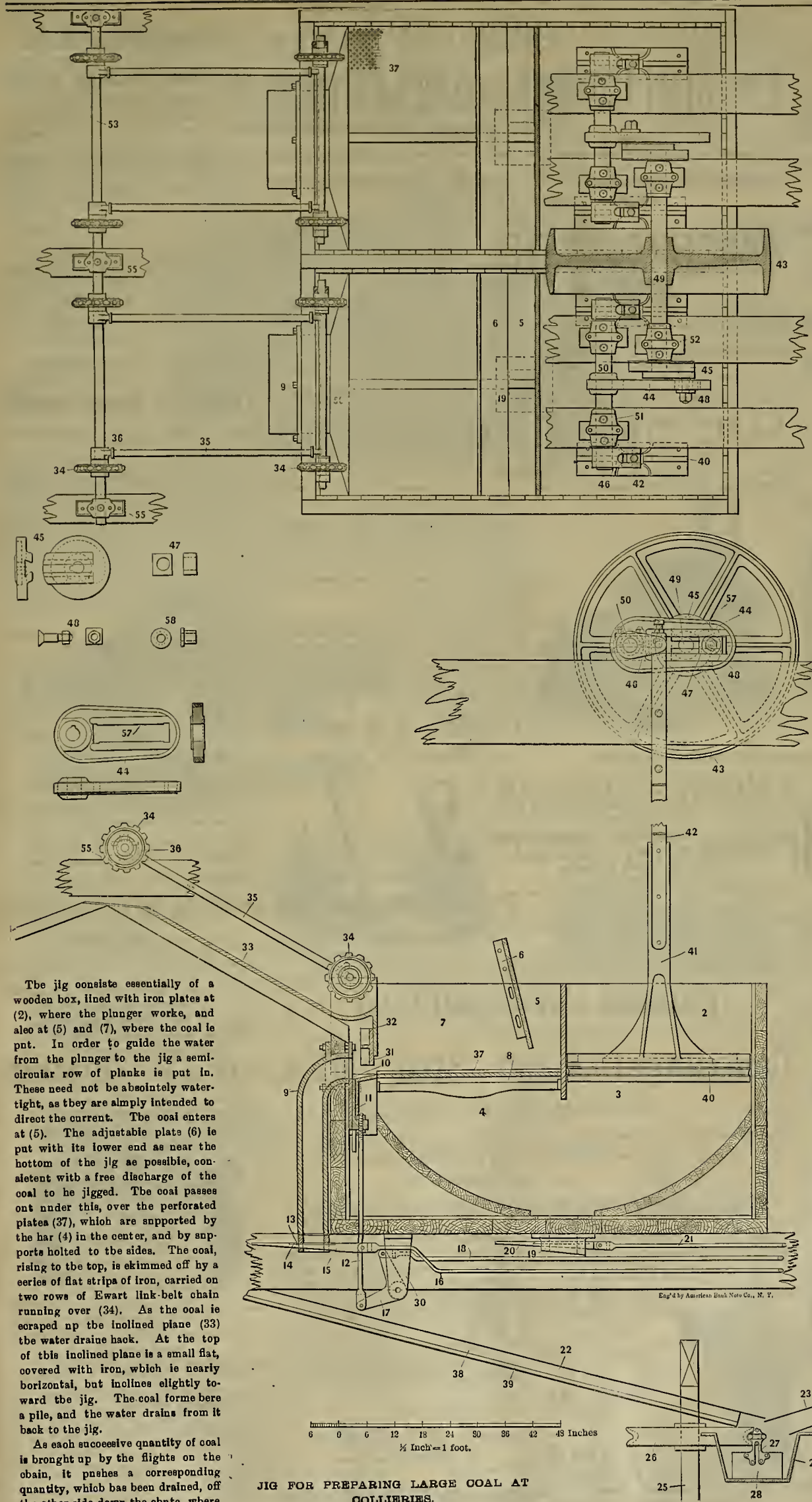
The supervisors have decided to visit the scene of operations at Iowa Hill, accompanied by an attorney and a surveyor.

This is a common sense thing to be done. If litigants could be brought together in this manner oftener, there would be less for the courts to do. These supervisors, after seeing the ground, can act in the premises with knowledge far beyond that acquired by reading the reports of splea or other interested parties. If these miners can do as they say, and get out their gold without appreciable damage, they should be allowed to do so without interference.

Jigs for Preparing Coal

The jigs used for the large coals at the Cross Creek collieries, of which there are 12 in the breaker at Drifton, Pa., are a modification of the Luhrig Jig. They may be divided into two parts, the upper being the machinery for moving the piston, and the lower the jig proper. In constructing them a tank is built long enough for the number of jigs desired. This is made water tight on the outside, and divided by partitions which need only be approximately water-tight, as there is water on both sides of them. The jigs are built in pairs, being about 5 feet wide and 6 feet long, so as to give a piston 5 feet by 3 feet. Pulley (43), (See engraving) is a heavy fly-wheel pulley, and is driven by a pulley on the line-shaft of the jigs. The jig-pulleys are all alike, and the pulley on the line-shaft is arranged so as to give the proper speed to the plunger (40). Through the pulley (43) passes the counter or driving shaft (49), at each end of which there is a crank-disk (45), the crank-pin (48) being so arranged as to slide from the center outward. By thus sliding the crank-pin (48), the stroke can be increased from nothing to 6 inches. Around the crank-pin there is a square block (47), which slides in the slotted arm (44). As the crank-disk revolves it gives the slotted arm (44), which is on the shaft (50), a motion like that of a pump-handle, which is communicated through the shaft to the two plunger arms (46), connected with the plungers (40). In consequence of the sliding of the crank-pin in the slotted arm, the motion upward of the plunger-rod is at a different rate of speed from that downward. The object of this is to force the plunger rapidly down, lifting the coal quickly, and allowing it to settle slowly. By running the fly-wheel pulley in the opposite direction to the hands of a watch, this effect is produced, the piston descending more rapidly than it ascends. The jigs are arranged in such a way that, while the piston of one jig is rising, that of the other of the same pair is falling. This diminishes the shock upon the machinery, since, to a certain extent, they counterbalance each other.

As the principal work is done in forcing the plunger downward, the plunger and plunger-rod are made very heavy, thus equalizing, more or less nearly, the work during a revolution. The lower part of the plunger-rod (41) is made of cast-iron, the upper part of two wrought-iron straps (42), which are welded together on top and are kept apart by a piece of wood which is bolted between them.



JIG FOR PREPARING LARGE COAL AT COLLIERIES.

It goes either to the picking chutes to be picked, or directly to the pocket, if it is (as in the case of the small sizes) already clean enough. The opening (10) through which the slate passes is regulated by elevating or depressing the plate (31), so arranged as to allow the largest piece of slate to pass under it. To the left of this plate (31), the bottom slopes in all directions to the gate (11), which generally remains open, but which can be closed by the lever attached to the bell-crank (17). Outside of this gate is a cast-iron flat pipe or slats-hopper (9), which is closed by the wedge-shaped slide (15), upon the upper surface of which is a piece of oak (14). Slide (15) moves in a casting (13), which has on each side a taper groove. When the slide (15) is pushed through this opening in (13), the wedging action of the taper grooves forces the wood against the face of (13), which is planed and bolted to (9). This makes an excellent gate for closing the hopper, allowing neither water nor slate to escape. If the closing is not perfect, on account of something catching in the slide, it is simply pulled back again. A similar arrangement at (19) and (20) lets out the slime and fine coal which accumulate in the bottom of the jig. The gate (11) is closed by forcing it up on the frame (10). This cuts off both the water and slate from the hopper.

When this has been done (15) is drawn out, and the water and slate fall upon the inclined plane (22), and slide down to a point over (27). Here the water drains into the drag-trough (29), and the men who stand at the right of (23) pull the slate over the edge of (23), allowing it to drop on to (24), and thence into the drag; while whatever coal may have come out with the slate is picked out and run, either directly to the pocket, or placed in boxes and carried there. At about the water line of the jigs there are holes cut through the wooden partition, so as to allow the water to flow from one jig to the other, and thus maintain a uniform level. The jigs are managed as follows:

One or more men, according to the number of jigs, are placed between the timbers overhead carrying the running mechanism and the top of the jig. It is their duty to see that the water is kept at the proper level, that the jigs and draws are working properly, and that the coal is uniformly distributed to the different jigs. The men who manage the other part of the jigs stand at the right of (24), and, by means of the lever (21) discharge the slime at the bottom. When too great a quantity accumulates in the tank, they close the gate (11) by means of the lever (19), and allow the slate to come out by means of the lever (16). As the slate is taken out, it is inspected; the coal is taken out, and if the jig is not working properly, as shown by the slate discharge, they notify the foreman in charge of the jigs. The man on top is also to see that the coal coming out of the jig is as clean as can be expected. If too much slate comes with the coal, there is something wrong with the jig, and it is his duty to notify the foreman.

The shaft (53) which drives the elevators, is continuous along the whole length of the jig house. The arms (35), which support the sprocket wheels at the lower end, are so arranged at the upper end (36) that they can be lifted up and turned around the shaft, so that if necessary (as if the coal for any reason should accumulate at the bottom) the sprocket wheels (34) can raise themselves or be raised without causing the stoppage of any of the rest of the machinery.

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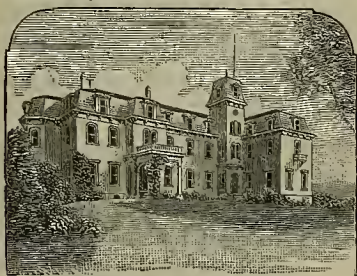
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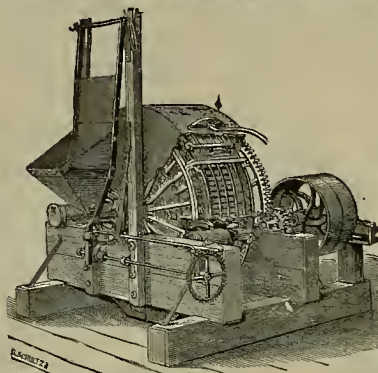
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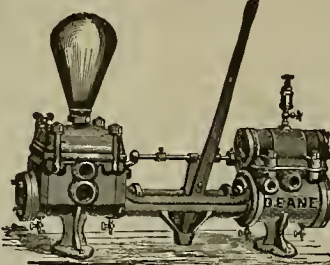
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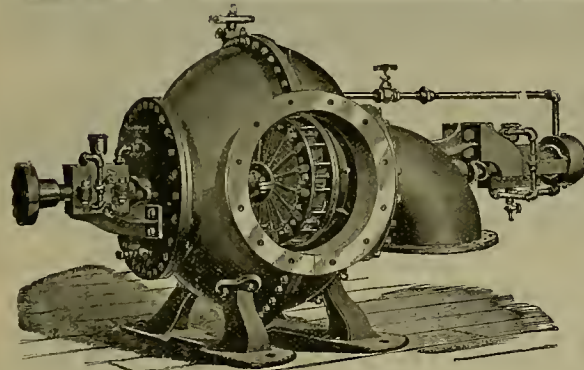
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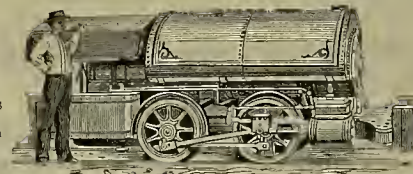
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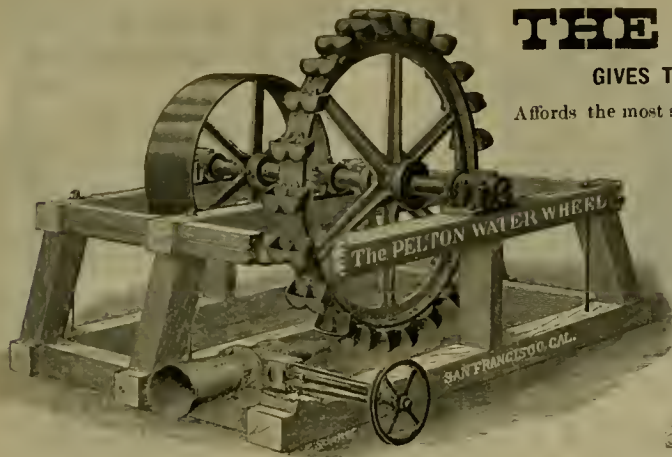
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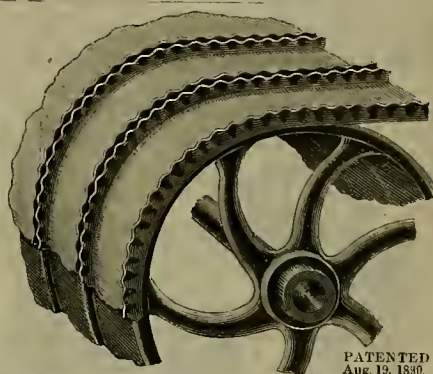
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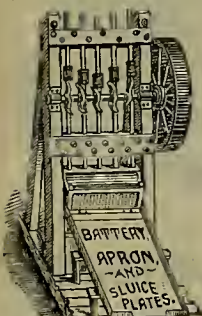
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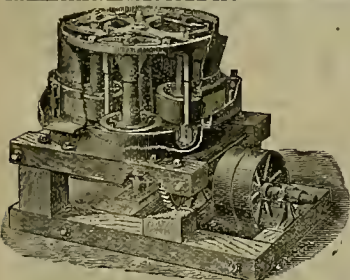
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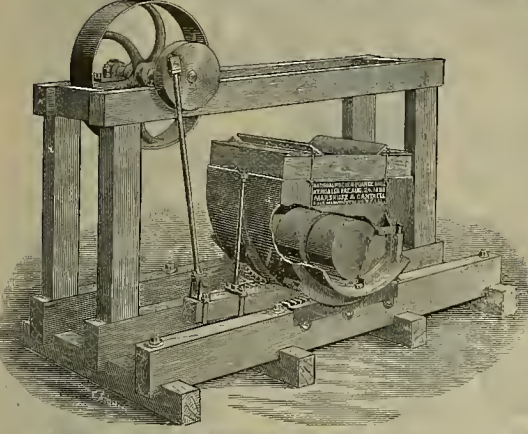
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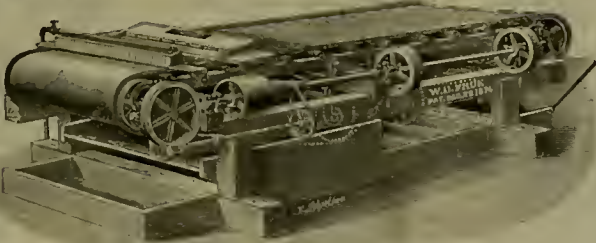
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Location of Works, Grass Valley, Nevada Co., Cal. }
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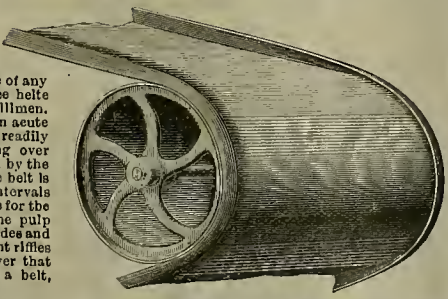
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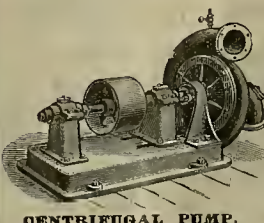
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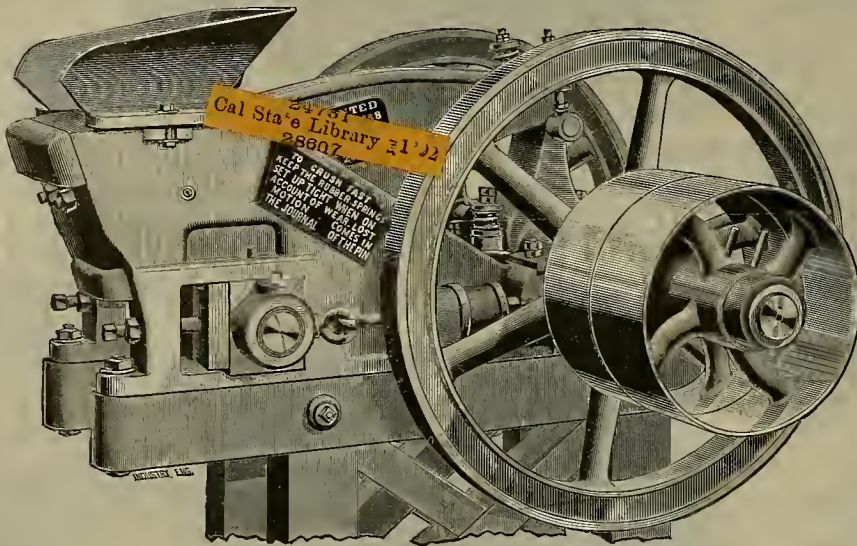
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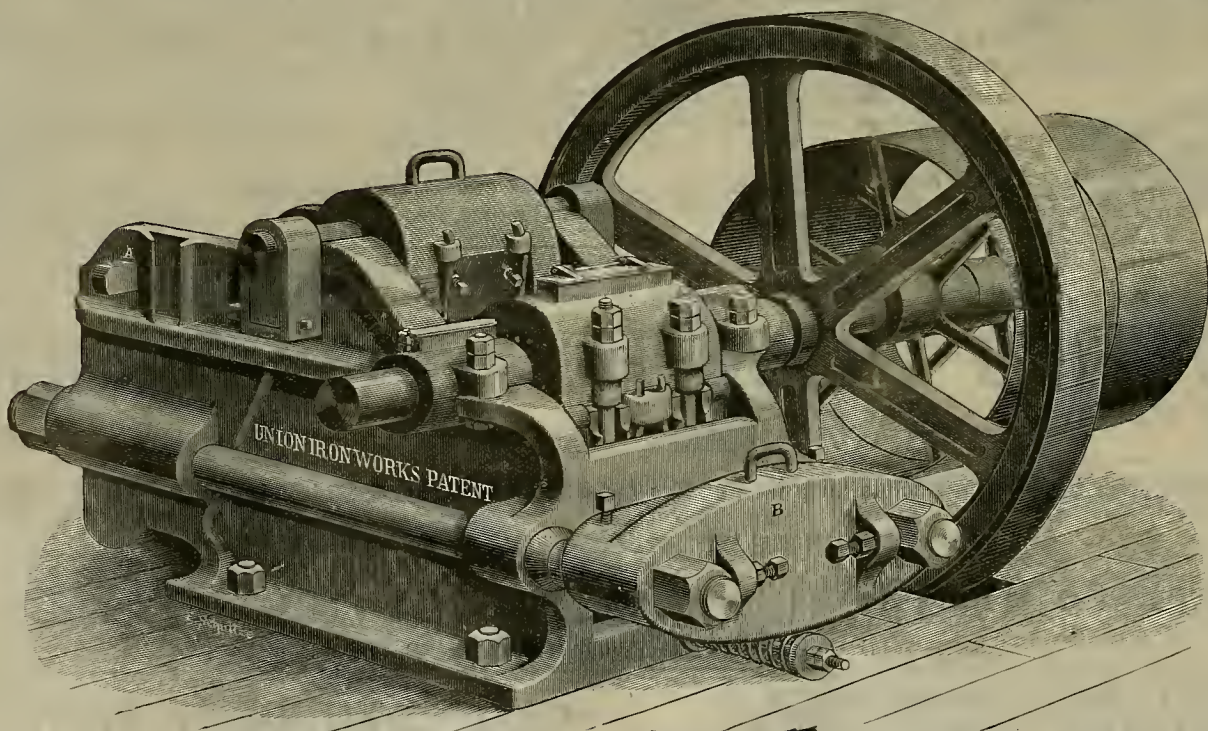
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A New Electric Road.

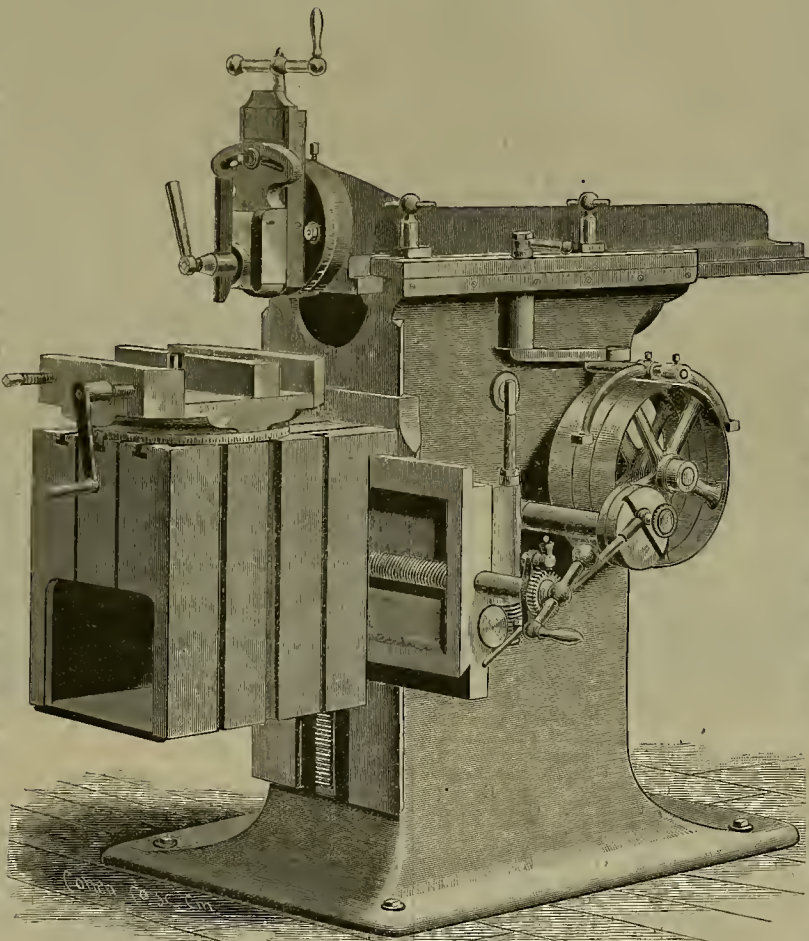
The driving of the last spike of the San Francisco and San Mateo electric road was accomplished with appropriate ceremonies on Wednesday, and as the first electric road on the San Francisco peninsula, marks a new era in railroad development in this State. The point where the silver spike was driven is at the county boundary line, near Ocean View. The new road begins at Stenart and Market streets, within a minute's walk of the ferries, and runs along Stenart to Harrison, out Harrison to Fourteenth, across Fourteenth to Guerrero, out Guerrero to Thirtieth, where it turns into San Jose avenue; out the San Jose road past Ocean View, where Wednesday's ceremonies took place, into San Mateo county, and on to Colma and the cemeteries. Here the present construction ceases, but the road will be continued on down to San Jose via Redwood City.

The first $5\frac{1}{2}$ miles of the road is of double track, but when reaching the sparsely settled regions a single track is used. The last portion of the road has T-rails of 40 pounds to the yard, made of Bessemer steel by the Pacific Rolling Mill Co. of this city. The rails down town rest on wrought-iron chairs, under which the ground wire runs.

The center-bearing rail, made use of in the city, is technically known as the "girder" rail, and is remarkable for its strength. The quantity used in the construction of the road through the city was 1,680,000 pounds—750 long tons of 2240 pounds, or 840 tons of 2000 pounds. The length of a girder rail is given as 63,360 feet. The quantity of steel T-rails, 40 pounds to the yard, used, was 840,000 pounds, or 375 long tons of 2240 pounds. In short tons of 2000 pounds this is 420 tons. The girder rail and T-rail divide Sec. No. 1 into two subsections, each 32,000 feet long.

The engine power used will be from the power house in Sunny Side, as already stated. Two of the engines will be of 500 horse-power each and one will be of 250 horse-power.

From Stenart and Market streets to the cemeteries in San Mateo county—Section No. 1 of the road—the total distance is 64,000 feet—12 miles and a furlong. Between 50,000 and



IMPROVED TRIPLE-GEARED SHAPER.

60,000 ties have been used. Under these ties has been placed wire aggregating 200,000 feet—38 miles of wire. This ground wire is of copper No. 2 size. The total length of wire overhead is over 76 miles, or to be accurate, 402,060 feet. The trolley wire is No. 0, the feeder

wire No. 1 and the span wire is five-sixteenths of an inch in diameter.

The road will open up a large tract of land along its line, and furnish convenience of travel to an extensive section. When completed it will be one of the largest electric

roads in the country. The officers of the railway company are: Behrend Joost, President; J. H. Gilmore, Treasurer; J. W. Hartzell, Secretary and General Manager. These, with Fabian Joost, form the Board of Directors. The construction and management of the road have been made under the personal supervision of J. W. Hartzell.

This new road will be of great benefit to San Mateo County, which has grown very slowly in population notwithstanding its many advantages and its nearness to San Francisco. Quicker, more frequent and cheaper transportation is expected to result, which should build up the suburban residence district of the county.

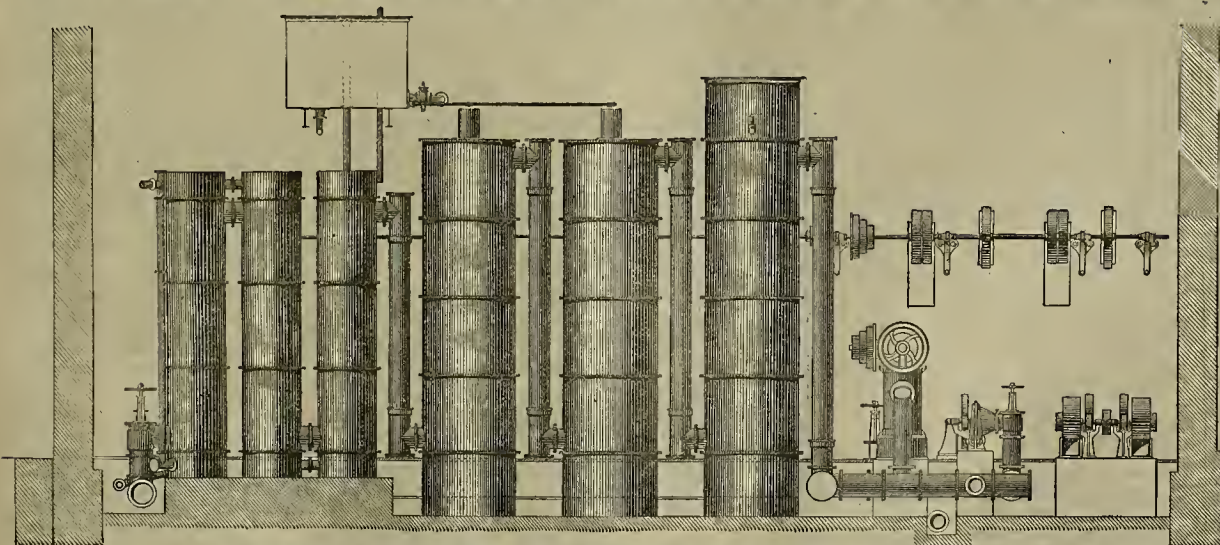
On the occasion of the driving of the last spike speeches were made by J. W. Hartzell, H. P. Bowle and Wm. M. Bunker, of the *Daily Report*. The latter gentleman, in his elaborate speech, gave an interesting resume of the progress of electric railroad work in this country. He has recently visited the north-west and witnessed the development brought about by the electric roads there. Intelligent observation convinced him of the great possibilities of these roads of improving certain sections in this State, not only as carriers of passengers, but of freights as well. The address of Mr. Bunker gave an excellent idea of the existing conditions with relation to electric roads.

Geared Shapers.

An engraving on this page shows an improved triple-geared shaper, which is made in 20, 26 and 32 inch sizes. In designing this machine, great care has been taken to give ample stiffness to resist strain of cutting tool. There is also a much greater range in every way than is usually furnished with a tool of this kind.

The vertical adjustment table is made with worm and wheel, operating a pinion working into a rack, and is raised and lowered at the same end of cross-head at which the operator is standing. This enables him to make every movement necessary in working the machine without altering the position or even stopping the shaper. This will be recognized as a great saving of time where a large variety of work is being done, or, in fact, under any circumstances. There is an open space under the ram that admits long lengths of iron clear through, and is very convenient in cutting key ways in shafts of any length, and up to three and one-half inches in diameter. The cutter bar or ram is driven by two bull wheels of large diameters, operating in double racks. The driving pinions are of steel, cut on the solid shaft. A counter-shaft is furnished with two changes of speed, and back motion is made two to one. In these machines, for which the Parke & Lacy Co. of this city are agents, the workmanship and material are of the best.

JOHN A. MARION, editor and proprietor of the Prescott (A. T.) *Courier*, dropped dead on the porch of his residence on Monday last. Deceased worked on various papers in this State 30 years or more ago, and has been a publisher in Arizona since 1864. He made a first-class paper of the *Courier*, which gives the best local news of any paper published in the Territory.



ELEVATION OF CONDENSING AND PURIFYING APPARATUS FOR BY-PRODUCTS FROM COKE-OVENS.—See Page 73.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Our Mining Interest and the World's Fair.

EDITORS PRESS:—Your criticisms on my article, wherein I stated that \$50,000 of the State's appropriation of \$300,000 should be set aside for the mining industry, must not be passed unnoticed. I have delayed answering from the fact that when I come to review California's interest in her mineral wealth, as illustrated by her legislative, judicial and business men's course, I see such a niggardly disposition displayed that I have taken on a good deal of the apathy of which you speak, as being the case with miners generally. No wonder they have no desire to spend their time in any public spirited way. The more they seek to build up, the more is the effort to break their enterprises down; yet the miner can stand this better than any other industry. He has his mine, works it, and don't have to go hawking around to get rid of the product of his labor. He don't care individually whether California has a good mineral display at Chicago or not; at the same time has a State pride, and with proper recognition of his rights will do his part every time, even to his own injury. The niggardly course pursued for the past ten years toward the mining interest of this State has cost the people many, many millions of money. The frequent judicial proceedings—the general cry against special mining operations—has put a stop to many a venture; no foreign, Western or Eastern capital comes to California as in the past, or as goes now to Colorado, Utah or Montana. Only a few days ago the S. F. press heralded the following, which shows the truth of this assertion:

CHICAGO, July 8.—Albert Verillon and C. Bourbon, French mining engineers, are in this city, en route to Utah. M. Bourbon said large amounts of French capital were ready for investment here as soon as the possessors of it are convinced that their money would be safely placed. To this end, Bourbon added, himself and companions were going to Utah and Colorado to inspect certain well-known mining properties. They would make reports upon them that could be relied on upon the Bourse. This was made necessary by the numerous wild-cat reports which were abroad in Paris about American enterprises.

When it comes to our San Francisco capital, there is so little of it for mining and so much out at "cent per cent" that it is fooling away time to undertake to interest it in mining developments. The result is, that what the people want (more money) they don't get, as in the past. It is not produced, and there is no encouragement for opening new mining properties.

In your issue of July 18th you say: San Francisco ought to have the Swansea of America, but is not. Why? Not altogether on account of railroad rates. Take your largest works—the Selby smelter—located handy, as you say, for ores from Mexico, Central America, British Columbia, Washington, Oregon and Alaska. Railroad rates don't effect any of the foregoing; California, Nevada and Arizona it does. Now, with all this vast field to work upon, the Selby smelters could be put in the back yard of either the Hill, Grant or Pueblo smelters of Colorado, and they have no such a field to work in. So it is not railroad rates altogether; it is the lack of business mining spirit of our own people. California in August holds an immigration convention, the ultimate of which is to send out flaming circulars that will mainly be distributed by labor agents to induce more pauper labor into the State, which simply becomes a dead weight, reduces wages, makes the rich richer and the poor poorer. In September, Colorado holds at Denver a mining Congress in which her Boards of Trade, Chamber of Commerce and representatives from all parts of Colorado take part. The subject-matter of this Congress is not for inducing immigration, but to see what she can do to advance her mining interest, to build up and enrich her present population and what she will do at Chicago (which will be what California is not yet able to approximate).

As regards my opinion that the California mineral exhibit for Chicago is only wanted for a cat's paw, I see nothing to change that view. I see the move to have an exhibit and the smallest outlay possible for it, no matter what is the damage, by moving the State University and Mining Bureau collection. You say the Commissioners have not even considered the matter of the mineral collection; this but strengthens my position, that they propose resting on the two collections above named. If they have not given the matter any thought or attention, then I will say it is time they did, for no interest requires so much time as getting together and classifying a mineral collection. I will be pleased to have their work prove my views all wrong. We will see. My proposition, as published in the PRESS some months ago, was for California to put forth her best efforts to make a fine collection of all belonging to the mineral kingdom, and have it understood with the donors, that after the fair was closed, the entire collection be donated to some public institution of Chicago, that would agree to keep it open for public inspection. Thus California would have a continuous exhibit for the inspection of mining investors from the East,

West and Europe, when visiting Chicago. The University and Mining Bureau no doubt have many duplicates that could be spared, and thus save the breaking up of the main collection. There are many private collections obtainable, all the latter being made returnable. My entire interest in this matter is to see something done, while up to this date nothing, you say, has been.

I have spoken of the niggardly treatment by California of the mining interest of the State. We have only to review her acts for the several World's Fairs to see it. We will start with the Centennial at Philadelphia in 1876. From official reports I list as follows:

Commended, for a spacious building, containing special woods of the State, also a fine exhibit of the natural resources of the State, animal, vegetable and mineral, made for the citizens of California by the Land Department of the Central Pacific Railroad Co. The railroad did it, not State pride.

Next on the list comes the Paris Exposition of 1878. For making the California exhibit for this, there was a long array of names, with but few workers. A collection was made, however, by the united effort of four individuals, who soon found they had expended some \$300 of their own funds, with not a cent in the treasury, and but for John W. Mackey, California would have been unrepresented at the Paris Exposition. Mr. M., being informed of the position of affairs, drew his check for \$5500. The State of California or business men of San Francisco did not pay \$100. The whole labor of the collection, which took about seven months to make, fell upon Henry G. Hanks, Melville Atwood, Solomon Heydenfeldt Jr., and your humble servant. A fine collection was made, a large number of the specimens being donated by and from the cabinets of the before-named parties. After the fair was over, this collection was donated to the School of Mines of Paris, and in the name of California, and the following was the acknowledgment:

VERSAILLES, Feb. 4, 1879.
Henry G. Hanks, Superintendent of Minerals.—Sir:—The Director of the School of Mines has informed me that the State of California has very generously disposed by gift in favor of this school of the very valuable and rare collection of ores, rocks and minerals from the Pacific States, which was on exhibition at the Exposition Universelle 1878. I desire you sir, to express my sincere acknowledgment to the Government of the State of California for this act of liberality. I also wish at the same time to return you my thanks for the obliging assiduity with which you have represented your Government in this affair. Receive, sir, the assurance of my highest consideration.
DE FREYCINET.

California received the credit at once. In 1880, the Legislature passed a joint resolution, thanking Mr. Mackey for his \$5500 donation, but our dignified legislators did not have State pride enough about them to appreciate Mr. M.'s liberality by refunding him the money as they should have done.

Next comes the Mineral Exposition at Denver, Colorado. Mr. W. B. Ewer (senior editor of your PRESS) was appointed Commissioner, and invested with rights to represent the State (at his own expense). Colorado had devoted a large space to California with Mr. Ewer (at his own expense) to fill it. California had nothing in her department, while all other States and territories were represented.

Next comes the New Orleans Exposition of 1882. For this exhibit, California appropriated \$10,000 and appointed as Commissioner a man no way identified with the mining interest, and as the Southern Pacific railroad footed about all the bills, some of this money was returned to the treasury. The space set aside for California was larger than for any State except Texas, and report says was creditably filled; for this the credit goes to the Southern Pacific Railroad Co., not the State of California. To this exhibit the Mining Bureau collection was taken. Henry G. Hanks, at that time being State Mineralogist, refused to move the collection without authority of the Legislature, which was obtained—Mr. H. going with and supervising the collection.

I could go still further, but this will suffice to show up how little California has done. She has been very lavish in appointing Commissioners, but very careful that they cannot creditably represent the State. She is now reaping the evil of her parsimony by having capital to pass her by. California has no consideration away, and it is this condition of things in which we want a change. It is not to injure any other interest that I say mining should have \$50,000—one-sixth of the appropriation. Are there five other interests in the State greater than mining? Is the demand unreasonable? The amount should not be foolishly expended, but judiciously handled, for the full showing up of all our mineral wealth on a grand scale, that we may draw to the State more capital for the production of more gold and silver, for the good of every interest and every individual.

ALMARIN B. PAUL,
Middle Creek P. O., Shasta Co., July 14.

Freight on Ores.

EDITORS PRESS:—The article in your issue of the 18th inst. is timely, and it is true in every particular. There is no doubt that, with politics, I will not say decent, railroad rates, large reduction works could be built up around this bay, and the same could be said of many other industries; but there is no likelihood of

the one railroad company we have ever building up anything but themselves. If they would ever do this in a becoming manner it would not be so bad, but I hear on all sides the freight service is altogether inefficient. I know as my own experience in the last several years that if I go north, east or south, on a sudden trip, I can never get a sleeper, but am forced into a rear train to pass the night among emigrants or Chinamen. Regard this as in parenthesis, and to return as to how they encourage mining. Certain parties not long since decided to put in reduction works at G—, not more than 160 miles from this city. In all the preliminary operations the railroads were like silk, charmed, delighted to have them inaugurate such an industry in their midst, and would afford them every facility in their power, and they did till the works were built and the parties' money was sunk in the ground and they could not help themselves. Then it was a case of the fly heaving walked into the little parlor of the spider. A preparation of soda necessary in their operations that cost \$2 a ton in San Francisco cost \$19 a ton to deliver at their works less than 200 miles away, and the railroads were responsible for all but a dollar or two of this. This is but a single sample, perhaps, of extortion practiced on most every article used, not only in these works, but in every other in the State where they have customers at their mercy. No, I hardly indulge the hope we will see a Swansea on the shores of San Francisco bay just yet; we will have to wait for that until the people who built these railroads wake up to the notion that it is about time to take their own property back.
T. D.
San Francisco, July 25, 1891.

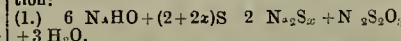
The Precipitation of Metals from Hyposulphite Solutions.

(Continued from last issue.)

[Read by C. A. STETTER, of San Francisco, before the American Institute of Mining Engineers.]

§ 2. Formation of Hyposulphite Salts.

The reactions taking place in boiling caustic soda with sulphur are expressed by the equation:



This is to say, for two equivalents of a sodium sulphide, one equivalent of the hypsulphite salt is formed.

For the formation of different sodium polysulphides, the quantities of sulphur consumed would be as follows:

100 c. p. caustic soda require c. p. sulphur.	100 caustic soda, with 30 per cent NaHO, require sulphur with 95 per cent S.	For the formation of
53.3	50.5	Na_2S
80.0	75.8	Na_2S_2
106.6	101.0	Na_2S_3
133.3	126.3	Na_2S_4
160.0	151.6	Na_2S_5

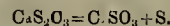
In manufacturing sodium sulphide there are no very important side issues to the reactions expressed by equation No. 1; and, taking into consideration the impracticities of commercial caustic soda and sulphur, calculations for practical purposes can be based upon them. There are, however, certain limitations to the equation. It is not true, for instance, when $x = 1$. In using an amount of sulphur only sufficient for the formation of Na_2S , caustic soda remains free, and polysulphides are formed besides Na_2S . It is even difficult to obtain a reagent absolutely free from caustic soda by using enough sulphur to form Na_2S_2 . Such a solution is also liable to contain some Na_2S and polysulphides higher than Na_2S_2 , a tendency prevailing to form the higher polysulphides. If we replace in equation No. 1 sodium by calcium, the reactions become still more complicated. In the first place, the equation is only true for CaS and CaS_2 . It is very probable, however, that some sulphhydrates are also formed, and this seems the case even in preparing sodium sulphide. I will here draw attention to the fact that H_2S frequently escapes at the end of precipitation, even if the solution has originally an alkaline reaction. This is the case in using both calcium and sodium sulphide as precipitants. The formation of H_2S can be easily explained if we assume the existence of enlyphides. The reaction would be as follows: $\text{Ag}_2\text{S}_2\text{O}_3 + \text{CaH}_2\text{S} = \text{Ag}_2\text{S} + \text{CaS}_2\text{O}_3 + \text{H}_2\text{S}$. Naturally, the H_2S only escapes when precipitation of the metals is nearly completed. This also explains an observation made by Russell at the Marsoe mill.

He says: "The solution running from the ore-vats to the precipitating tanks is perfectly neutral, but after precipitation with sodium sulphide, it is so acid that blue litmus-paper is instantly reddened by it. At the end of precipitation, the odor of H_2S is very perceptible; it even appears during precipitation if stirring is not well done."

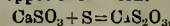
This, it seems to me, shows the presence of enlyphides. The H_2S formed in the beginning of precipitation is absorbed by the solution, throwing down metals and setting acid free. To return to the calcium sulphide:

The reaction is also disturbed by the formation of oxy-sulphurets, which are not easily soluble, especially if sulphur is not used in excess to form CaS_2 , and by decomposition of calcium hypsulphite at boiling point. While a sodium hypsulphite solution can be

heated to boiling without detriment, that of the calcium salt decomposes above 60°C . as follows:



This decomposition is, however, resisted in the presence of C. S_4 and CaS_2 , and counteracted by the opposite reaction:



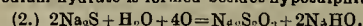
Which takes place between 30° and 40°C , that is to say, after cooling and setting of the solution. To what extent these opposing reactions balance each other is not known, and depends, most likely, upon various circumstances.

For these reasons it is not possible to calculate beforehand, even approximately, from the chemicals consumed, the effect of a calcium sulphide solution in precipitation, or to compare it, merely by calculation, with the same effect of a sodium sulphide solution. Only actual mill statistics make a comparison between the two reagents possible. It can readily be seen, however, that the preparation of CaS_2 must involve a waste of chemicals compared with that of Na_2S_2 .

According to equation No. 1, 100 parts of caustic soda, consumed in the manufacture of sodium sulphide, will produce 103.3 parts of $\text{Na}_2\text{S}_2\text{O}_3 + 5 \text{ aq}$.

Or 100 parts commercial caustic soda, containing 90 per cent NaHO , would produce 93 parts $\text{Na}_2\text{S}_2\text{O}_3 + 5 \text{ aq}$. Both sodium and calcium sulphide solutions, if exposed to the air, oxidize with formation of hypsulphite salts, but the latter more rapidly than the former.

In case Na_2S is exposed to the atmosphere, sodium hydrate is formed besides hypsulphite:



The caustic soda is then converted into carbonate by absorbing carbonic acid from the air. Na_2S_2 is completely converted into hypsulphite, while the higher polysulphides are oxidized with precipitation of free sulphur.

O. Hoffman, who used CaS_2 as precipitant at the Silver King mill, Arizona, stated to me that the original stock solution was used over a year and a half, and that it increased in strength and volume, making it necessary to run a part of it to waste.

In this case a large amount of copper and lead was precipitated with the silver. This is good evidence to show how rapidly CaS_2 oxidizes. What has been said about the more rapid decomposition of calcium sulphide in contact with air, compared with sodium sulphide, holds good regarding the respective hypsulphite salts.

Russell exposed solutions of different concentration in soap-plates to the atmosphere for seven days, at a temperature of from 20° to 22°C , and brought them to their original volume at the expiration of that time. The relation of the depth of the solution to the diameter of the plates was about 1 to 8. The deterioration which had taken place was for sodium hypsulphite, 1.4 per cent, and for the calcium salt, 16.1 per cent.

Formerly lixiviation-solutions were never heated; the new practice finds it profitable to operate with solutions of a temperature as high as 50°C . Would not the loss in calcium hypsulphite be much increased in such a case, when complete decomposition takes place above 60°C ? The stubborn advocates of the old practice in lixiviation say: We never needed to buy sodium hypsulphite; our stock-solution increased in strength, and we had to run it finally to waste! But at what expense, gentlemen, in caustic lime and sulphur, and inferior extraction in silver, did you reach this result?

(To be Continued.)

Results from Free Coinage.

In the course of a column letter on the effects of free silver coinage in the United States, William M. Stewart, Senator from Nevada, paints this rosy picture:

"Let either be restored and the volume of real money increased, and prosperity will follow as the light of day follows the rising sun. Prices will rise, and producers of wealth will be rewarded by the enhanced value of the fruits of their toil. The value of farms and farm products will be enhanced and agriculturists can pay off their mortgages, support their families and educate their children."

"Stocks will rise, the people will have money to buy them, and stock exchanges will be overrun with business in filling the increasing orders from people who will be encouraged to buy because the prices are advancing. Business will be active, and the merchants will prosper because the people are prosperous, and all who are industrious can supply themselves with the necessities and many of the luxuries of life, and pay cash on delivery."

"Even the aoid neurer will be benefited; the danger of loss by the bankruptcy of his debtors will be removed. Safe security will be ample at reasonable interest, because men of enterprise can afford to borrow money to invest in property and pay good interest when property is advancing in price."

JOSEPH HAMPTON was seriously injured by a cave in a mine at Jeckes Hill, Trolmeire Co., on Friday of last week. He was working by himself when a couple of tons of earth fell on him, and his whole body, save his head was covered up and painfully wedged in the earth and rock. He was thus confined for three hours, when a passer-by discovered his situation. A number of bones were broken and there is not much hope of recovery.

Gigantic Red Cedar.

Swelled bases to the trunks of our forest trees are not uncommon, especially to certain species of the great Cypress family, including the *Sequoia*.

Of course such swelling is a great detriment to a lumber tree, especially when accompanied by hollowness of the part, as often happens. The most inveterate sinner on this coast, in respect of egregious expansion and wind-filling interior, is exhibited by the Gigantic Red Cedar (*Thuja gigantea*), or Pacific Arbor Vita, of the forests of the Northwest.

But the hollowness of this tree is not excoriated in fifty felleets by the aboriginal inhabitants of the country. The Indian just chops down a tree, cuts it off at the proper distance, splits off the upper side, pines up the ends, and there is his canoe!

The Atlantic species of the same genus—*Thuja occidentalis*—is more inclined to have swelled bases than ours, while the Bald Cypress—*Taxodium distichum*—exceeds all other trees in this respect, the trunks being three or four times as large at base as they are at the height of 15 or 20 feet; and this is the tree which, in addition to hollow trunk, develops large balloon-like excrescences from the surface roots, called "cypress knees," and the subject of much speculation on the part of scientists.

But all the trees which are given to enlargement of the base are not also hollow-hearted. This is particularly true of the two species of *Sequoia*. Their bases are seldom empty barrels, but rather well stored huts of compacted material, arranged in buttresses that brace up a monster tree and enable it to carry up a columnar shaft to a great height.

But all the same, hollow or well stored with excellent lumber material, the big swell of a tree is not prized, and its owner is obliged to contrive means to climb above the enlargement before cutting his tree. Some build scaffolds to the desired height, others erect ladders against the trees, but the most used and ingenious method is shown in the illustration on this page.

This tree is a "swell," belonging to the Red Cedar species common about Puget Sound, and often met with along the streams on the coast as far southward as Cape Mendocino. The workmen menacing the tree with ax and saw are seen standing on planks, one end of which is fixed into the tree. These planks, about three feet long, are narrowed at one end and provided with a strong iron shoe or upturned grip. A hole is cut into the tree, the board inserted at an angle, the outer end depressed when the grip takes effect, and thus a staging is formed for the workman, who, however, must be level-headed to swing an ax on such a narrow perch, often at the height of 20 to 30 feet.

To cut off a tree above the swell is to save half the labor of cutting and to rid the owner of the irregular gnarled or burned out butt of his tree, but an Eastern citizen's first exclamation when visiting a redwood stump field is "What a waste!" This was the constant lament of the American Horticultural Society when visiting the noted Guerneville region three years ago.

They could not be convinced that stumps of solid redwood, as big as a four-room cottage, were worthless for timber—except now and then one which displays some peculiarity of curled or wavy grain.

As these stumps are well nigh indestructible, except by fire, there is here a reserve supply of timber which, in view of the fast disappearing forests, may be utilized by the coming economist of the Northwest.—J. G. Lemmon in *Pacific Rural Press*.

The Government Rain Racket.

We have previously alluded to the experiments soon to be made under the auspices of the Department of Agriculture to determine whether agitation of the air by explosions will be followed by rain. Congress ordered these experiments and appropriated money therefor.

Carl Meyers of Frankfort, New York, has charge of the explosive parts of the enterprise, and Gen. Drydenforth is general superintendent of the experiments. A large shipment of apparatus has been shipped to an arid region in Northern Texas, where the trial will soon be made. It is said that there are three score balloons, each ten feet in diameter when expanded; likewise about 100 kites five feet high,

a freight car full of wooden mortars to fire bombs from, and many thousands of pounds of dynamite, gunpowder, nitro-glycerine and other powerful agents.

It must not be supposed, however, that this bombardment of the heavens will be conducted without scientific method. Before it is begun the observers of the expedition will ascend in a suitable aeronautic balloon and find out by the way the hydrometer works at what level the explosives may be most advantageously set off. If they discover the greatest amount of moisture at an elevation of 1500 feet, that is the stratum of air in which they want to do their work. The theory of the matter no one pretends to understand very thoroughly, but it is imagined that the artificial combustion of a sort of vortex or hole in the air, into which the heavier moist particles rush, so as to occasion condensation and precipitation of rain. It is surmised, also, that the small particles of water made by the explosion of the combining oxygen and hydrogen form a sort of nucleus for other particles to gather about. Another important idea is that the watery particles in the atmosphere, being heavier than the rest of the air, are shaken out of it by the concussion and fall upon the earth.

The notion is that, supposing the efficacy of explosives for producing rains once proved, communities or farmers might make it their business to establish detonating plants, employing for the purpose balloons, kites, mortar bombs, or what not. The balloons to be used in the approaching Government trials cost about \$22 apiece, but the expense entailed for a score or so of these would be of no consequence to a district for which a single good shower might signify \$10,000, or even \$100,000 of value.

A convenient and excessively arid plain will be selected for operations and the wooden mortars will be planted across it in drills, as it were, for a distance of about two miles. They will be loaded with dynamite, rock-rocket, and other materials calculated to agitate the atmosphere as much as possible, while at suitable intervals of space the balloons will be arranged for ascension. Simultaneously a flight of kites will be let loose in the air.

The three-score balloons will in themselves represent an extraordinary scientific novelty.

They are all completed now, and each one is calculated to hold about 525 cubic feet of gas—one-third oxygen and two-thirds hydrogen. The oxygen is put in first and then the hydrogen. Each balloon, upon being inflated, ascends under control of a double wire, which serves instead of a rope to hold it by. When it reaches the desired height, the button of an electric instrument on the ground is touched, a spark ignites a fuse in the balloon, and the oxygen and hydrogen suddenly combine with a terrific explosion. Experiments made in Washington show that such an oxy-hydrogen balloon, thus ignited, produces a really tremendous detonation, the cloth or paper vessel itself appearing for an instant and by daylight like a ball of fire. Few things can be imagined more curious than this phenomenon, which signifies that the two gases, at the touch of fire, have united in the shape of a drop or two of water, which harmless fluid consists of two parts of hydrogen and one of oxygen.

But, as has been said, the balloons will be supplemented by great kites, each of which will be held by a double wire instead of a string. Their tails will carry dynamite and other explosives, which will be set off in the same way by the electric spark. Meantime, while the oxy-hydrogen bags explode and the kite tails go hang, the hurried mortars will vomit forth dynamite to the heavens all along the two-mile line. For at least two and possibly three days the racket will be kept up. Then the expedition will hoist its umbrellas and calmly await the downpour, consoled for the inconvenience by the exclamations of an agricultural population, which has learned to appreciate the fact that moisture is wealth.

CALIFORNIA ELECTRIC LIGHT CO.—At the annual meeting of the stockholders of the California Electric Light Company held Monday, the acts of the directors during the past year, including the proposition to form a new company in conjunction with the Edison system, were unanimously approved. The old directors and officers were re-elected. The directors are: P. B. Cornwall, Gustav Sutro, Alvin Hayward, Wm. Kerr, George H. Roe, Ramon E. Wilson and John R. Spring. The officers are: P. B. Cornwall, Pres.; Gustav Sutro, Vice-Pres.; George H. Roe, Sec'y, and the Bank of California, Treas.

Postal Telegraphy.

An Omaha journalist, Mr. Edward Rosewater, who has for several years given much attention to the promotion of the movement for postal telegraphy, is now doing public service by visiting Europe for the purpose of gathering information as to what foreign Governments have really accomplished in this direction. Mr. Rosewater was summoned last winter before a committee of Congress, which had been formed to obtain information respecting the advisability of the Government buying up or controlling the postal telegraphic service of the United States. He went abroad with official letters to the heads of the telegraph services of England, France, Germany and Austria.

A reporter who visited Mr. Rosewater in Paris asked what opinions he had formed from his investigation. In reply he said that he was more than ever confirmed in the opinion that the effect of government control was to produce a superior telegraphic service. He said that London employed no less than 3000 persons in the telegraphic service, whereas in New York there were only 1200. The object of the English Government was not to make a revenue, but to give the public the best service at the cheapest possible rates. In every place where there were 1500 persons there was a postal telegraphic service, whereas in the United States towns with several thousand inhabitants had nothing but the railroad telegraph service.

This is just the state of affairs which we supposed such an investigation would bring out. Where the Government owns the telegraph, the public is cheaply and efficiently served, and telegraphing becomes a common means of inter-communication. Where the business is controlled by monopolies, as in this country, the charge is exorbitant, the services inefficient, and people do just as little with the wire as they possibly can. It is certainly a reflection upon our intelligence and progressive spirit as a people that we are willing to be hampered and repressed in this manner. We have much to learn from some countries which are looked upon as old foggy and slow-going in some respects. We hope Mr. Rosewater's report will wake the people up on this question.

The Storage Battery Patent.

A dispatch from New York, dated July 23d says: "Mr. Brush was the first in this country to make the broad invention. He is entitled to the fruits of his invention. It is policy to reward him." In a decision embodying these words Judge Cox of the United States Circuit Court for the Southern district of New York, substantially brought to an end, for the present at least, the five years' litigation for the control in this country for the manufacture and sale of storage batteries. The decision is of great interest to electricians and to officials of railroads, many of whom, intending to use electricity as a motive power, were compelled to halt, pending the result of the litigation. Among these roads is the Fourth Avenue Surface Line in this city, which will now proceed to put storage battery cars on its line permanently.

The patents, of which Charles F. Brush is owner, and the Consolidated Electric Storage Co. is licensee, have 12 years more to run, thus giving that company a monopoly of the storage battery business in this country for that time. Judge Cox's decision was given in the case of the Brush Electric Light Co. against the Electrical Accumulator Co.

A fight has been waged for years between the Julien Electric Co., the Brush Electric Co., and the Electric Accumulator Co. Following this the Consolidated Electric Storage Co., successors to the Julien Electric Co., purchased the exclusive license throughout the United States for the Brush storage battery patents, and the cause of the Brush corporation against the Electrical Accumulator Co., was pushed and came to a hearing about a month ago. The decision awards to Mr. Brush the sole and exclusive right for the manufacture and sale of every type of modern storage batteries.

HENRY HARLAND, the amalgamator at the Uncle Sam mine, on Squaw creek, Shasta Co., has left for South Africa, where he will enter the employ of the De Beers mining company, the same company in whose employ is Mr. Butters, formerly of Shasta Co.

GIGANTIC RED CEDAR — *Thuja gigantea*.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

LOUVRE CON. GOLD MINING. Co.—*Ledger*, July 25: This company, with office in San Francisco, owns five claims in Plymouth district, about four miles north of the town of Plymouth, near the Bay State claim. They have about 13 men employed, and have run a tunnel 155 feet into the hill, exposing an ore body, said to be between four and five feet wide, 140 feet from the surface. The company are working on two claims, and feel very much encouraged at the outlook. The ore is reported to be of good paying quality.

GOVERN.—Work is progressing favorably at the Govern. On the 18th, they succeeded in clearing the 1000-foot level of water. We are glad to report that they find a most promising outlook on this level, there being in sight a large vein of ore in the face of west drift of good milling quality. During the last 60 days, the electric pumps have landed on top over 1,000,000 gallons of water daily. During this time the steam pump in the bottom has caused the electric motors to be continually dripping with moisture, showing that by proper insulation there need be no fear of wet or damp mines. As soon as the sump is cleared, preparations will be made to commence sinking the shaft for another level. Last month's run proved to be very satisfactory to the stockholders, and a bright future seems to be dawning upon the mine.

REEVES.—A vein of ore was found in sinking shaft, which promises good returns, as it prospects well in free gold.

QUARTZ MOUNTAIN.—Preparations are being made to start up the mill for a test crushing. Mill is now being put in order, and several important changes are being made with a view to a closer saving of the gold and sulphurets. Two Woodbury concentrators will be used for concentration, and the tailings run over a canvas plant like the Govern. Settling tanks and sluice tanks will be added, and it is hoped by these precautions the rock can be made to pay.

MISCELLANEOUS.—A few tons of quartz from the Mello claim, at Jackson Gate, were crushed recently at the one-stamp mill of the Amador gold mine. The yield, we are informed, was \$10 per ton. This fell far below expectations. It would pay well at that rate if they had a mill near the mine, but to hire a mill and pay for hauling three miles is a losing proposition. The Kennedy mine paid a dividend of 49 cents per share last month. It is reported that the last cleanup amounted to something like \$90,000. They have commenced sinking a shaft at the Clinton Consolidated. A kiln of 100,000 brick has been burned for the purpose of building chlorination works.

El Dorado.

NEW HILL.—*Mt. Democrat*, July 25th: Preparations are being made for the erection of a five-stamp mill at the Baltic mine, in Baltic district. They have about 100 tons of ore on the dump, and the mine so far developed as to keep the mill supplied for a long time. The ore pays, by arrastra process, \$40 per ton. At the Blue Gorge mine, in the same district, development is being vigorously prosecuted. The vein is found to be 100 feet wide between walls, filled with gold-bearing material, every foot of which prospects well in free gold. The Scironi mine, in the same district, is being opened up, the ore showing free gold. S. A. Lane is making good progress with his tunnel at Russian Diggings, to develop a gravel channel. Good ore is now being taken out at the Parker mine in Brownsville district. Their mill is kept running. It is reported that the old Spanish mine, near Fairplay, will be started up again in September. A good bench of gravel has been struck in the Rogers mine at Smith's Flat. At the Toll House mine, near Smith's Flat, a few men are at work drifting north. The tunnel at the old Granite gravel mine has been retimbered. At the Landecker mine, at Weaver Hill, a force of men is drifting out gravel, and the mill is kept running day and night. N. J. Coleman is sinking a shaft with a full crew of men at the Agnes mine, in Diamond Spring district. Dan Wickham and George Ranney have just completed a hoisting plant at the Bryant mine, in the same district, and sinking will commence Monday. At the Church mine, in Mud Springs district, richer ore has been struck at the 600-foot level than has ever been found in that mine above that level. Good ore is being taken from a 100-foot shaft at the Los Padre mine, near Nashville. Attention is being attracted to the Jay Hawk district. Some fine samples of ore have been exhibited from mines there. The Pacific Co. of Placerville are making developments all along the line. The Pacific mill is running ore from that mine. A mill is reported in contemplation at the Epley, where they have opened up a fine body of ore. It is also reported that they will soon begin crushing ore from the Harmon mine. They are running tunnels to crosscut ledges at other points along the line of their extensive system of mines. The Gentle Annie mill, at Poverty Point, is running regularly and increasing on its regular output of bullion, the ore improving in character as they get deeper on the vein.

GEORGETOWN DISTRICT.—The mill at the Taylor mine is kept running regularly, and it is reported that rich ore is being brought to the surface. The Van mine is tied up on account of litigation among its owners.

KELSEY DISTRICT.—The mill at the Dalmatia mine is working regularly 4000 tons of ore per month. The entire cost of milling and mining the ore is only 45 cents per ton. They have a mountain of material, and though of low grade it is paying a large margin. Captain Newton will have his new hoisting plant at the Darling mine ready to run the coming week. At the Martin & Amhar mine good progress is being made with their new plant. J. A. Jurgenson is opening up a mine on Dutch Creek, which is reported to contain \$60 to the ton in gold and silver. The vein is 30 feet wide.

GRAVEL.—*Georgetown Gazette*, July 23: The Dow gravel claim at Cement Hill, four miles north of town, is being prospected under the management of Messrs. Wm. Gassman and J. S. Houser of Woodland, and A. Dow of this place. Some time ago, Mr. Dow had over 700 feet of tunnel driven

in on the mine, which proved to be too high. This spring the new company began work on a new tunnel, now in over 100 feet, which gives 70 feet more depth. J. C. Rich is now sinking an air shaft which will soon be completed and work on tunnel resumed.

DRIFT.—The Calmes gravel mine on Otter creek has been taken hold of by John McKenney, the Lake Tahoe landlord, who is engaged in running a tunnel to drain the mine at a depth of about 100 feet below the shaft which had to be abandoned because of too much water.

Calaveras.

QUAKER CITY MINE.—*Calaveras Chronicle*, July 25: We visited the Quaker City mine, located near the junction, about four miles south of this place, last Tuesday. We were affably received by the genial superintendent, T. A. Goodwin. The shaft has now attained a depth of 500 feet, the contract for sinking the last 100 feet being about completed. When this last sinking was commenced at the depth of 400 feet, an ore body between three and four feet in width was followed down at an angle of about 64° to a depth of about 58 feet when the rock changed to vein matter composed of blue black gouge and kidney-shaped quartz rocks ranging all the way from the size of a man's fist to boulders four feet in diameter. Sinking through 37 feet of this vein matter, a solid body of fine-looking ore was again encountered, measuring about three feet in width. This is very encouraging.

SIGNS OF AWAKENING.—*Campo Seco* is on the eve of an awakening. The cause of this prospect of renewed business activity is the commencement of operations to re-open the rich copper mines in that locality. There is already fine and extensive plant by which the ore has been worked, and thousands of tons of ore are in dumps ready to be reduced. A new company has now the property in hand, of which Mr. C. Borger, of Campo Seco, is the superintendent, and operations are to be conducted on a more extensive scale than ever before. Smelting works are to be erected, grading for the plant being now about completed. When all is completed and the works and mine are in full blast, there will be employed in and about the mine and works between 200 and 300 men. The revival of the copper mining industry in the locality means an infusion of new life in the town.

Inyo.

INCREASING.—*Inyo Index*, July 24: Mining developments in Inyo are being made at a steady rate and ore production is constantly increasing. With silver above \$1, and lead advancing, a much greater output of ore is among the certainties.

Mono.

THE LAKEVIEW MINE.—*Bridgeport Chronicle-Union*, July 23: The Lakeview mine at Lundy continues to be the center of attraction to the people of this country, and pilgrimages are being made to it from all parts of the country. Postmaster A. F. Eryant, of Bridgeport, took a drive to Lundy on Wednesday, and returned on Thursday, full of enthusiasm over the mine, which is rich, beyond anything he has known in the mining line. A few tons of ore worked at one of the mills produced a \$500 gold brick. The mine, as far as developed, is a mass of gold, it being estimated that there are \$10,000,000 now in sight. The machinery for the mill is probably now on the site selected for its erection, and no time will be lost in erecting and getting it in operation. A large number of men are working on the road, which is nearly completed. A rich 13-foot strike has been made in the disputed ground of the Bulwer and Standard Con. at Bodie. It was struck by the Bulwer miners, who stopped work when a protest was entered by the Standard Con. Unless these corporations compromise, it will lead to another big suit, as the territory is too rich for either to give it up without another legal struggle, and in the meantime it does not help Bodie or the county.

Plumas.

NOTES.—*Plumas National*, July 25: Last Tuesday, we took a trip to the Homestake mine, owned by Thomas & Thompson, and found the boys hard at work. This company has run a bedrock cut 20 feet deep a distance of 200 or 300 feet, and will now have to run a tunnel 250 feet before they will strike the ground they intend to work. An immense amount of work has been done during the summer by this company, but when once into the mine, their reward will be rich. We next visited the old Jackson ledge, where we found Messrs. Braden, Larson, Orr, Richards, and John McCarty hard at it. A five-stamp mill is being put up under the supervision of Mr. McCarty, which will be completed in a week or so, when, if one can judge from the prospects that the rock shows, we will hear of some rich returns. From Joseph Peppin, who was up from Granite Basin this week, we learn that the mining outlook is very flattering in that district. The Gold Saver ledge, owned by Mr. Peppin, is on a good paying basis. A 20-stamp mill is on the mine, and a tunnel is in between 300 and 400 feet on a well-defined ledge from 12 to 14 inches thick. The rock crushed averages \$20 per ton. The Hidden Treasure, also owned by Mr. Peppin is another good ledge, on which a prospect tunnel has been run, showing up \$10 rock. The Oliver Quirk and Morning Star ledges are also owned by Mr. Peppin. On the former a tunnel is in 800 or 900 feet, the ledge being a foot or more in width, and the rock goes \$12 a ton. The Morning Star ledge is 2½ feet in width, and is a true fissure ledge lying between granite and slate or iron rock. The sulphurets from this ledge, which are of a bluish color, assay \$700 per ton. W. C. Graves has a five-stamp mill on the Flowerpot vein, with a tunnel in about 100 feet. The rock prospects rich. On the Amos Swan location, on which is a five-stamp mill, a cleanup of \$400 was made for one month's run. The rock crushed paid \$20 a ton. A Christie, who owns the Mexican ledge, has a tunnel in about 500 feet. The ledge is 20 inches wide, and the rock goes \$15 a ton. Mr. Bowers also owns a ledge and has a tunnel in 60 feet with \$10 rock. See & Jolly, who own the Specimen ledge, are in 300 feet, the rock being good for \$16 a ton. Granite Basin is bound to be one of the best quartz mining camps in the county, before a great while.

Sierra.

PROSPECTING.—*Mt. Messenger*, July 25: J. E. Hubbard, who is prospecting on the Middle Fork, not far from the Four Hills quartz mine is running a cut into a flat at the junction of Four Hills creek and the ravine that comes down from the Franklin

Consolidated gravel claim. He is not on bedrock yet, but the gravel prospect.

QUARTZ.—Streaks of quartz were struck recently in the Maple Grove tunnel, but a prospect yielded no gold. The rock is a little harder than it has been.

POKER FLAT.—T. C. Corlett was over from Poker Flat, Thursday, and said that he did better than he expected to in his gravel claim, pay averaging over \$6 a carload.

TUNNEL.—Wm. Rouse has nearly finished the lower tunnel to the quartz ledge of Jesse Carney at the head of Jim Crow canyon, there being only 15 feet to run to tap the ledge.

Siskiyou.

SCOTT BAR.—*Cor. Siskiyou Telegram*, July 24: Mining in this section offers to the people a field of study replete with pleasure and utility. Wonderful progress has been made in prospecting throughout this section in the last few years, and still the way to other grand discoveries lies open to the diligent miner so we desire to call the attention of who are in search of mines to the fact that in the near future Siskiyou will be the hanner county of the State. The several Hill and River mines in this vicinity are now under headway. Among those I might mention are Bennett & Co., and Reynolds & Jacobs. Bennett & Co. are busily engaged reopening their drift. They expect to be taking out pay grit in about a week. Reynolds & Jacobs' mine, continues to pan out well, considering that their water supply is very short. They are at present engaged in changing the position of their pipe and giant. The Never Sweat mine on French Bar will be of the wingdam species and it no doubt will yield well to its owners when opened. Brunt & Co.'s mine on French Bar yields fair returns to the owners. The McCauley on French Bar, owned and managed by McCauley & Son, promises this season to pay exceedingly well as this claim is adjoining to one that yields well. D. W. McCarty is opening up a new mine on Red Hill south of Scott Bar; the prospect is favorable.

Trinity.

EAST FORK.—*Cor. Journal*, July 25: There are at present about 100 inhabitants on the creek including Chinese, and every mine except the Golden Chest is being worked. At East Branch, Krumpke & Co. are building arrastras for working their rock, and will soon have them finished. On Yellow Jacket, the Alaska Co. has shown up a large amount of high-grade ore. This company has been doing development work on its mines for two years, and now is satisfied that they have a good proposition. The ledge on the lower will average three feet in width. Suitable machinery for milling the rock will soon be put in position. The Yellowstone, which had been temporarily closed down, started up its mill on the 14th with rock enough in sight to run for months. Continuing on down, we come to the Enterprise and Lone Jack. The mill is running on full time on Lone Jack rock, a large amount of which is in sight; and as the formation is soft, the ore can easily be extracted. The mine is favorably located on the west side of East Fork, and can be worked at a very small expense, the mill being run by water-power. The North Star Co. has tapped the lode with something over a 300-foot tunnel. The ledge at the crop-out is about three feet in width, and looks well. A tramway with cable attachment is being built to lower the ore down the mountain to the main tram, from whence it will be transported to the mill by horse-power. The Thanksgiving mine on Barney gulch is nearly fitted up to commence crushing. New tunnels have been run to tap the lode at a greater depth, and the vein is three feet in width where cut and looks very promising and prospects well. A tramway has been built from the mine to the mill and will do away with the old method of hauling the ore in carts, which is an expensive way of conveying ore any distance. The mill that used to crush the ore is a large-sized Huntington, run by steam and fitted up with all the modern appliances for saving gold. The Old Engle mine on Rich gulch is turning out well. The owners have run a new tunnel on the lower level under the old works, and have found a large body of rich ore. This mine was the first quartz location made on East Fork over 20 years ago. The mines of East Fork are in a more prosperous condition than they have ever been seen since the first location was made, not that they are any richer, but for the simple reason that they are being worked in a systematic manner. Capital has taken hold of them, and a large amount of money has been expended in prospecting and developing the discoveries, which has been of great benefit to the county in general.

Tuolumne.

POCKET MINING.—*Independent*, July 25: Another pocket was struck this week in the Swerwer mine, at Tuttletown, making about \$8000 recently extracted. The Oakes, Yancey and Shaw mine, on the old St. Cyr ranch, has been producing some of the golden article during the past several weeks, though as yet nothing very big. The Eichelroth mine, on Brown's Flat, worked by Smith & Eichelroth, is displaying a good prospect. Several hundred dollars have been taken out during the month. A cave occurred this week in Kelley's Last Chance mine.

NEVADA.

Washoe District.

CON. CAL. AND VA. MINE.—*Virginia Chronicle*, July 25: There has been extracted from all parts of the mine during the week 2295 1070-2000 tons of ore, of which 864 1920-2000 tons was shipped to the Morgan mill and 1430 1150-2000 tons to the Eureka mill. The average assay value of all of the ore worked at these two mills during the week (2440 tons) was \$22.66 per ton. Bullion shipped to Carson Mint, assay value, \$37,857.42. Bullion now on hand in our assay office, assay value about \$20,500.

OPHIR.—1465 level: We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore has been extracted during the week.

MEXICAN.—On the 1465 level, the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift has been advanced 27 feet; total length, 57 feet; in vein matter showing clay separations.

UNION CON.—The northeast drift started from

the east crosscut No. 2 on the 1465 level, at a point 853 feet in from the main north lateral drift has been extended 27 feet; total length, 53 feet; in a mixed formation of clay, porphyry and quartz.

CHOLLAR.—The new station at the 1500 level in the incline is completed. Extracted and sent to the mill the past week 520 tons of ore, worth \$10.20 a ton, as per battery samples.

POTOSI.—The winze is down 53 feet below the 1500 level. The bottom is in porphyry and streaks of quartz.

EXCHEQUER.—East crosscut on north line, 600 level, is out 271 feet; face in porphyry.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level, is out 42 feet; face in quartz yielding low assays.

UTAH.—725 level: The south drift from the winze station has been extended 20 feet; total, 156 feet, continuing in a hard porphyry formation. At a point in the south drift 52 feet from the winze station have started a southeast drift in a quartz formation.

SIERRA NEVADA.—On the 630 level west crosscut No. 1, from the northwest drift, 571 feet from the shaft, is advanced 724 feet, 37 feet having been made during the week, continuing through the same formation.

OCCIDENTAL.—Extracted 40 tons of fair-grade ore from the stopes on the 350, 400 and 450 levels. Have started to stope ore from the 550 level at the head of No. 2 winze. The top of the stope is in \$40 ore. Milled during the week 285 tons of ore of the average assay value of \$16.25 per ton.

GOULD & CURRY.—East crosscut 65 feet above the 200 level has been advanced 16 feet through low-grade ore; total length, 71 feet. West crosscut opposite east crosscut has been extended 10 feet; total length, 92 feet; face in soft porphyry.

BEST & BELCHER.—1100 level: East crosscut from northwest drift has been advanced 15 feet; total, 90 feet; face in soft porphyry and stringers of quartz. West crosscut No. 1 from top of upraise from 200 level was advanced 20 feet; face in hard porphyry and stringers of quartz.

Jackrabbit District.

DAY AND MENDHA.—*Pioche Record*, July 25: Supt. S. T. Godbe reports matters at both the day and the Mendha mines as looking exceptionally well. At the Day, the new tunnel being run in the Junction ground is in some 90 feet. The ore body continues to improve in size and quality and a winze and an upraise are being run in it, both in ore, though in the upraise the ore is much better in quality than it is below. About 28 tons of ore from this place have been shipped to Milford as hack freight, the average value per ton of which was 90 ounces in silver with a good percentage of lead. A large quantity of similar grade ore now lies on the dump. From the indications present Supt. Godbe believes the development in the Junction will equal those in any other quarter of the mine. At the Mendha the new working incline has reached a depth of 535 feet, and the mine looks better than it ever did before. The ore now lying on the dump, taken out in the course of development, will, it is estimated, give a net yield of \$13,000. The new incline shaft which goes down at the same angle the whole distance, was for some time past out of the ore channel. Last week ore was struck again, and on Tuesday a splendid showing was made, when the drillings, 18 inches deep, from a 7 by 9 foot face of ore were assayed and showed a value of 105 ounces in silver per ton.

Pine Nut District.

GOLD DISCOVERIES.—*Silver State*, July 28: The excitement over the Pine Nut gold discoveries near Carson is growing. Between 12 and 15 prospectors arrive daily. All go armed to protect their claims, and bloodshed may follow over some of the ledges. The entire country, covering a space of ten square miles, is full of quartz ledges, many showing free gold on the surface. Hebe Holman, foreman of the Best & Belcher and Gould & Curry at Virginia, says of the diggings: "I have made a thorough investigation and regard the excitement as based on a good foundation. The discoveries are as good as those made on the Comstock, and if the surface indications amount to anything, the result will be a heavy influx of mining men within the coming week. Several regular surveyors are now on the ground surveying over 50 claims. There seems at some time to have been a general upheaval which pushed the ledges through the surface. Wm. Zirn, the discoverer, panned out \$60 in one pan before me yesterday, and says he has taken out \$400 in a small sack." A town-site has already been laid out and named Zirville. A stage-line will be put on from Carson by Oliver Roberts. The distance is 25 miles. Teams will take out building material as soon as possible.

COLORADO.

SILVERTON MINES.—*Miner*, July 15: Henry Miller has started up work on the Blucher in Eureka gulch, and is getting out a fine grade of ore. Frank Brown has leased the United States Treasury, and two men took out a car of ore the first 11 days. Supt. Ward of the Lead King mine reports a good showing of ore, and contemplated building a mill at an early date. In the stope of the Senior Warden a streak of ore has been uncovered which assays 560 ozs. silver. The ore previous to this was low-grade.

Sam Funk is working a force of men on the Indiana, formerly the Poison Spring, and is sacking ore for shipment. John Fossback made a strike in his Bonita mountain property a few days since. The ore is principally gold bearing and yields \$210 per ton. Supt. Grabowsky this week started work on the Black Prince, a fine property owned by W. B. Severn, of Chicago and Thos. Merrill, of Saginaw, Mich. The Pearl started up this week with 12 men. The force was employed excavating for the hoisting plant which is to be put on the mine. Wm. Moyle is foreman. The King mine is looming up grandly. The last carload of ore yielded \$75 per ton. Eight men are employed on the property and the Herr brothers are happy. Ed. Brown, Dr. Copp, Dr. Rader and Cashier Valles, of Durango, have secured a valuable property near Ophir. Ore extracted and sold to date, while drifting, leaves a margin after paying all expenses. Steve Higgs is now foreman of the Caribou at Ophir. The mine is said to be looking first class. Steve is a rustler and will endeavor to make the mine pay well. A fine body of sand carbonates has been found in the Mary Beal claim above Gladstone. The stuff seems to be de-

composed iron, among which is found boulders of lead. Probably the capping of some ore chutes. The Tyrolean leasers on the Ohio are doing well from the start. They are in good ore both on the surface and in the tunnel. Some seven tons of ore are sacked this week, and the output is now steady at one ton per day. A seven-ton lot of gold quartz from the Mastiff, owned by J. W. Heck, was put through the Ward stamp mill this week. Ten and one-half ounces of gold were saved on the plates and several hundred pounds of concentrates was the result. Mr. Heck has a large body of this ore. The formal transfer of the Sampson was completed fast week, and the first payment has been made. Mr. James W. Mason, of the San Bernardino company, will be the manager. The mill is to be enlarged at once, and a large force of men employed on the mine.

THE MCARTHUR-FORREST PROCESS.—Bedrock Democrat, July 6: At last it seems that all things are in readiness at Cracker creek for the long talked-of test of the ores of the Eureka and Excelsior mines, owned by the Eastern Oregon Consolidated Gold and Silver Mining Co., by the McArthur-Forrest, or Cyanide, process controlled by the Gold and Silver Extraction, Mining and Milling Co., of Denver Colorado, a process that is said to have been successfully worked in South Africa and Australia on base ores. The Denver Co., have made an outlay of about \$8000 in preparing machinery, etc., for this test, which outlay will be returned to them if the test proves successful. Last Saturday, Mr. Gordon Wilson, of Denver, the expert in whose hands the success or failure of the test lies, arrived here and immediately proceeded on to Cracker creek by stage Sunday to commence operations. The test will be made first on a run of 25 tons, and if successful a run of 100 tons will be made. During the present week Mr. John B. Farish, the prominent mining man, also of Denver, will arrive here in the interest of the E. O. C. G. S. & Co., and on his report, future operation of the Eureka and Excelsior mines will be governed. The success of this test is devoutly to be wished for. If successful, a new era of advancement and prosperity will take on, not alone in the Cracker creek district, but in adjacent camps. If failure should result, the mining industry will receive a setback that will take years to recover.

ARIZONA.

CABLE LINE TO A JUNCTION.—Prescott Courier, July 22: A special train went over the road Monday night. General Superintendent W. B. Jones, Col. L. F. Eggers and the writer were the only easy riders until Jerome Junction was reached, at which place E. L. Preston came on board, anxious to meet Hon. W. A. Clark of Butte, Montana, owner of our great United Verde mines and smelters, likewise several other mines and smelters. His people, here are mining and smelting on a large scale. They are also constructing a cable line from Sander's Station to Jerome. Clarke's head men said that Supt. Giroux had two furnaces running and others almost ready to run. Mines are well developed and producing fine ore. The plant is one of the largest and best in the Southwest. Carloads and piles of machinery for the cable road, also a great Corliss engine, were lying at the junction. Work on the cable road is progressing, and it will not be long until the work of building railroad to meet it will be commenced.

GOLD.—I. T. Stoddard's people have found considerable rich gold ore in the Copper Mountain mine. A mill will soon be running. Mr. Stoddard left for Chicago to-day to meet Jesse R. Grant, Commercial M. Co. has about 120 men in its employ in Big Bug district. They are running the smelter, taking ore out of the Boggs and pumping water out of the Hackberry. Same company has about as many more men as the Senator and Copper Basin. W. A. Clark of United Verde has about 160 men employed. Heavy shipments of sulphurets keep coming from the Congress.

IDAHO.

MOOSE CREEK PLACERS.—Helena Journal, July 22: Ed Mitchell has returned from the Moose Creek placers, just over the Montana line in Shoshone county, Idaho. In early days these mines were extensively worked, expensive ditches being constructed to operate the rich channels and bars; these worked out, the diggings have for years lain dormant. This season some 50 miners were engaged in prospecting and sluicing with favorable results. The rains have not been as copious as in Montana, and work for the season is about over; most of the miners engaged in the district will return next season, as it is demonstrated good pay can be made. Some promising quartz leads have been discovered, but not yet sufficiently developed to determine their value.

SMOKY.—Wood River Times, July 17: There is somewhat of a reawakening in the Smoky mines. The Hidden Treasure above Revis' placer claims, and which is owned by Charles Sherry, of this city, shows considerable ore of a somewhat low grade as a rule, but some of it will pay a good profit. Newt. Revis' placer claims are being worked as usual, and as the supply of water is much greater than usual this year, the yield should be equal to that of the best years. Below Mr. Revis' claims a Minneapolis placer mining Co. in which Captain Austin is the principal shareholder, began operations a few weeks ago, under the superintendency of David Whitmer, former owner of the claims. About a dozen men are at work, preparing to lay a bedrock flume down Little Smoky creek. The flume is made on the ground by Hailey carpenters, and the work on the water ditch that will supply the flume is commenced. This ditch will give a head of 27 feet at the head of the flume, and water is expected to be turned on within 10 days. The ground being quite rich, no doubt is entertained of the success of the company. In Galore gulch McCarter & Reedy are beginning to extract ore from the Tyrannis, and the leasers on the Galore-Stormy have some ore out, which they think will assay 500 or 600 ounces of silver to the ton. The vein is not very wide, but the boys say that a few inches of such ore do very well for men of moderate expectations. There is a great quantity of ore in sight in the 3000-odd feet of openings in this mine. Ten men are employed in Galore gulch. At the King of the West the last shipment of accumulated ore from last winter's work was made this week. This mine, it will be remembered, was shut down this spring. Now that silver is again appreciating in value, the workings of the mine are being pumped out and preparations made for an

immediate resumption of operations. At the Pot Wrestler, Trade Dollar, and several other properties, the leasers or owners are either extracting ore or getting ready to do so. Altogether, about 100 men are at work in Smoky.

BOISE BASIN.—The Monarity Bros. have ordered of Fraser & Chalmers a 10-stamp gold mill for their mine at Elk creek. Geo. Stuck has gone up to commence preparations for erecting the sawmill as soon as it arrives. This will be the fourth mill erected on that vein. The first was the Suh Rosa, which was erected at the Suh Rosa mine, discovered by W. W. Horton. Mr. Horton run the mill, which was a 10-stamp, for several years. It was accidentally burned six or seven years ago. The Forest King, a location farther west on the same vein, has had a five-stamp mill for several years, and a 10-stamp was erected on the Washington, which joins the Suh Rosa on the east. The latter has been running two years, during which time it has turned out considerable bullion. As the mill is a wet crusher the large quantities of silver ore coming out has to be laid aside until such time as the company concludes to erect roasters. The argentiferous is the richest ore they have and when the roasters are erected, which will most likely be this fall, some big cleanups may be looked for. At present the mill runs only during the day, yet the monthly cleanups range between \$8000 and \$12,000. The mine has now nearly paid for all development and the mill and steam hoisting works. The vein on which these mines are situated is traced and located a distance of three or four miles. Gold and silver has been found on it the whole of the distance, and when properly developed there is no doubt but that six or eight large mills will be needed to reduce the ore. The course of the ledge is nearly east and west, and it is situated 10 miles north of Idaho City. Wm. Sweet has been obliged to discontinue work in the Muddy shaft at the head of Grime's creek. This shaft followed the vein down a distance of about 240 feet, and is large and rich in free gold all the way. Whether the company will erect hoisting works or run a tunnel from the Payette side is not yet decided upon. It is not known whether the London company having bonds on the Washington group of mines in Gambirino district, and the Moscow and other mines in El Dorado will purchase them. It is hoped that the sales will be made as the company is a go-ahead, energetic one and has already spent over \$1,000,000 in this county which was a total loss.

MONTANA.

PLACER MINING.—Mining Journal, July 15: In the present season of copious water supply little thought is given to improved methods of working gravels for the purpose of extracting their gold contents. The average placer miner is content, as with the employment of the old means the output will far exceed that of many former years, yet it is a fact that the inventive genius, so dominant in this age, has been and is continuing to devote much midnight oil and great capital in the endeavor to realize greater results from a given amount of the forces of nature. In the dredging and amalgamating plant now working on the bars of the Jefferson river above Three Forks, not far from \$100,000 has been expended to demonstrate the practicability of the process. The promoters are now on the ground and it will soon be known to what extent success has been attained. It is well known to all placer miners that the hydraulic process, even with the use of undercurrents where applicable, fails to recover fine gold which exists in varying quantities in all channels and bars, and the first end, endeavored to be attained by the application of machinery is the saving of this fine gold, in many instances of greater value than that recovered in the boxes, and secondly, the economical use of water. Experiments on a practical scale are being made in California, Montana and Colorado to accomplish these two purposes the final result of which will absolutely revolutionize placer mining, and many grounds now abandoned will be worked with great profit. The fundamental principle upon which all of these new methods are based is the lifting of the gravels by mechanical means, depositing the same in machinery designed to eliminate the coarse gravels, saving the fine residuum and subjecting it to an amalgamating process through the use of water and quicksilver. Given a yard of gravel, by mechanical means dispose of the heavy gravels composing three-fourths of the bulk, and it can be readily seen that only one-fourth of the water required to treat the entire mass will be required, and that 100 inches of water will perform the service 300 would under the ordinary method; add to this the saving of fine gold that can be recovered, and the result is the profitable working of gravel heretofore considered valueless. In all of these projects grade and dump are immaterial factors; ground can be worked down grade as well as up grade. In this department of mining there are a dozen Richmonds in the field, and a sure winner is among them. Hold fast to your placer grounds.

NEW MEXICO.

CONTENTION.—Southwest Sentinel, July 17: The Contention mine in the Tres Hermanas district has just been leased to Mr. Martin, formerly foreman on the Graphic mine at Cook's. This mine belongs to John D. Ball, the heirs of Tom Hall and the McComas heirs. It is a blanket formation of silver-bearing lead carbonates, lying on top of lime. The ore carries from \$8 to \$16 silver, and from 30 to 50 per cent lead. The ore body runs up to four feet in thickness. It was formerly worked under lease and handsome royalties were paid. As the railroad from Deming southward will pass within three miles of this property, it will become much more profitable.

BULLION.—The freight and express shipments of bullion, ore and concentrates from Silver City during the month of June amounted to \$15,491 worth of gold, \$184 worth of silver, 115,320 pounds of high-grade sacked gold and silver ores, 442,500 pounds of concentrates, 960,000 pounds of lead ore and 1,800,000 pounds of iron ore. These figures are as nearly correct as possible, allowance having been made for undervaluation and underestimation of weights. They make a very fair showing. The amount of sacked ores is over 150 per cent greater than last month. The lead shipments have more than doubled those of May and quadrupled those of April. There is a decided increase in the amount of iron ore, and there is half as much again of concentrates. Owing to the building of the Silver City & Northern R. R., no zinc ores have come in for shipment from the Hanover district.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JULY 21, 1891.

- 456,321.—VEHICLE TONGUE SUPPORT—Allen & Sandhofer, Auburn, Cal.
- 456,393.—CLAMP FOR CULTIVATOR TEETH—D. E. Barton, Alameda, Cal.
- 456,478.—SIGNALING APPARATUS—R. J. Crowley, Los Angeles, Cal.
- 456,356.—WINDOW CLEANER—J. O. Culver, Calistoga, Cal.
- 456,241.—TREATING COCONUT HUSKS—J. T. Davis, S. F.
- 456,256.—VALVE FOR GAS ENGINES—H. C. Fletcher, Pasadena, Cal.
- 456,492.—SASH BALANCE—Axel Johnson, S. F.
- 456,494.—SAFETY CAP FOR POWDER, KEYS—W. Mahoney, Santa Cruz, Cal.
- 456,425.—FEED CUTTER—J. McKenna, Martinez, Cal.
- 456,315.—REVOLVING CYLINDER ENGINE—C. G. Ruths, S. F.
- 456,166.—GUN LOCK—Z. W. Shields, Harrington, Wash.
- 456,260.—GATE—C. W. Thompson, Tomales, Cal.
- 456,320.—SUPPLYING WATER TO VESSELS—N. T. Whiting, S. F.
- 456,455.—SPRING MOTOR—H. H. Wilburn, Ritzville, Wash.
- 456,263.—PROP—J. K. Woodward, Riverside, Cal.

The following brief list, by telegraph, for July 28 will appear more complete upon receipt of mail advices: California—Washington Berry, Angel Island, sash balance; Maria Bingham, assignor of two thirds to A. Johnson and O. C. Hanson, Shelton, Washington, eaves trough hanger; Elijah B. Blaisdel and J. R. Morse, Los Angeles, hydro carbon burner; Matthew P. Campbell, Glasgow, assignor to himself and J. Rutherford, Spokane Falls, Wash., toothed gearing; Harry T. Clarke, assignor to Portland (Oregon) Iron Works, reversing valve; Pedro Costa, San Francisco, fishing-boat attachment; Adolf Fritsch, Sulem City, knife and scissors sharpener; William B. Harrington, assignor to himself, E. L. Jones and J. D. Deffries, San Francisco, railwa; Charles C. Lane, assignor to Hughes & Co., San Diego, Cal., roller for quartz-mills; Marshall Martin, Walla Walla, Wash., machine wrench; Nathan A. Wheeler, Alpowa, Wash., scissor.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraph). American and Foreign patents obtained and general patent business for Pacific Coast inventor transacted with perfect security, at reasonable rates, in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

REVOLVING CYLINDER ENGINE.—Chas. G. Ruths, S. F. No. 456,315. Dated July 21, 1891. The three cylinders of the engine are fixed so as to radiate from a central shaft, and this shaft is journaled horizontally so as to rotate within its journal-hoxes. The outer ends of the cylinders may be open, and within are fitted the pistons having piston rods extending outwardly, and upon the outer ends of these rods are fixed anti-friction shoes or rollers. A ring is fixed upon a base, and surrounds the cylinders and shaft so that the latter is eccentric to the interior periphery of the ring. The position of the shaft with reference to the ring is such that when either cylinder stands with its end downward below the shaft, its piston will be forced into the inner end of the cylinder by reason of the contact of the anti-friction roller or shoe with the periphery of the ring at a point where said ring is nearest to the shaft upon which the cylinders are fixed. From this point the distance gradually increases until the cylinder is at the top or above the shaft, when its piston will have gradually moved out until it is at the outer end of its stroke, the shoe at the end of the piston rod remaining in contact with the interior periphery of the stationary eccentrically mounted ring. It will be manifest from this construction that whenever steam is admitted into either of the cylinders after it has passed its lowest point, where it is nearest to the periphery of the ring, the pressure upon the piston, forcing it and the piston rod against the interior of the eccentric ring, will cause the shaft upon which the cylinder is mounted to rotate, the piston gradually moving outward until it has reached the opposite point, where the piston is at the greatest distance from the center. Several of these cylinders being mounted upon the same shaft, each one takes steam successively as it passes the nearest point, and thus the operation is continuous. The action is similar to that of an inclined plane, the anti-friction roller upon the outer end of the piston rod traveling over the eccentric ring, which gradually increases in distance from the point where steam is first admitted until the cylinder has arrived at the point nearly opposite, and which is at the greatest distance from the central cylinder shaft, when the piston will have reached the outer end of the cylinder and the termination of its stroke in that direction. The following cylinder will meantime have arrived at the proper point to receive steam, and consequently two cylinders will be receiving steam at all times and acting to rotate the shaft. By this construction the inventor claims to provide a very simple and economically operating engine which is available for many kinds of work where but little space is available for an engine.

DEVICE FOR SUPPLYING WATER TO VESSELS.—Nathaniel T. Whiting, S. F. No. 456,320. Dated July 21, 1891. This device is specially applicable for the purpose of supplying salt water in large quantities to be used on steamers in connection with the condensers, and also for other purposes where necessary on such vessels. Large quantities of water are necessary for the purpose of condensing the steam used in steam-vessels, and this water is usually supplied by pumps, to actuate which, steam must be supplied from the boilers and more or less waste of power thus takes place. To obviate this, Mr. Whiting places an inclined pipe opening upward at or near the bows of the vessel, inclining

gradually upward from that point to the point of discharge and provided with check-valves. The pipe is made with an expanded mouth, which is fixed so as to be water-tight where it passes through the vessel, and at a point sufficiently below the surface of the water as to remain submerged except in case of great roughness of the sea. The check-valves open inwardly, but will close at any time upon a considerable reduction of the pressure so as to prevent water which is already within from flowing backward into the sea in case the movement of the vessel should momentarily raise the mouth of the pipe above the surface of the pipe. At the high rate of speed which is usually obtained by steamers, the water will be forced to rush into the mouth of the pipe and up the gradual incline until it reaches a point sufficiently above the condensers to deliver the water to them, from whence, after use, it may be discharged again in the usual manner. It will be manifest that the pressure within the pipe or pipes will be constant as long as the vessel is in motion, and that no power but that will be needed to raise all the water that is necessary for this purpose and for washing decks and other kindred purposes. A valve may be inserted to prevent ingress of water when not desired or when the vessel is running where there are foreign substances which it is desired to keep from the pipes.

VEHICLE-TONGUE SUPPORT.—George Allen and Joseph Sandhofer, Auburn, Placer county, No. 456,321. Dated July 21, 1891. The object of this invention is to provide a simple and effective support for the poles of vehicles, adapted to be readily attached to and released from the pole, and not liable to get out of order or be in the way. It consists of a bracket adjustably secured to the under side of the pole, a spring having its forward end fitted loosely in the bracket and a bearing-plate secured to the axle, having its front end extended and inclined upwardly to form a support for the spring.

SASH BALANCE.—Axel Johnson, Oakland, assignor to the Marshall Improved Window Furniture Co., of S. F. No. 456,492. Dated July 21, 1891. This invention relates to that class of sash balances in which a spring is let into a bore in the sash-rail and actuates and is actuated by a pinion which engages a rack on the window-casing. The present invention consists in a new and useful improvement in the spring, and in a novel arrangement providing for a pinion on each side of the sash engaging a rack on each side of the casing. The inner portion of the improved spring—that is to say, that portion which returns on the inside of a smaller sized wire or rod than the outer portion. There are many important advantages which result from this present improved construction of the spring.

BABY CARRIAGE.—Salome P. Davis and James H. Dicks, San Jose. No. 455,909. Dated July 14, 1891. The object of this invention is to provide a simple and effective means for locking the wheels of the carriage in order to prevent it from rolling when unattended. Baby carriages are often released by the attendant for a greater or less time, and allowed to stand. Upon city sidewalks especially, which are always sloping, the carriage will roll down by gravity, and accidents from this cause are not infrequent. This invention prevents any movement of the unattended carriage by securely locking its wheels.

WAY-UP MINES.—There are in the Andes, Peru, two mining camps which are higher up than any in this country. These are Vicharayao, 15,950 feet, and Mnoapata, 16,158 feet and more above the sea level, each with a population of miners averaging 200 the year around. High as some of the points are on the Panama Oroya railroad of Peru, of which the Galera tunnel is the summit, that road will be surpassed by the narrow-gauge railroad now under construction to connect with it. This, when completed, will have a length of 75 kilometers and a mean altitude of 15,350 feet. In one of the mines a tunnel is being driven at a higher elevation than Galera, which, when completed, will be fully as long, if not longer, than that tunnel. This work is being done by means of compressed air drills, and the tunnel is lighted throughout by electricity.

THE PELTON WATER-WHEEL CO. of this city writes us as follows: "It having come to our notice that our patent rights are being infringed upon, all intending purchasers are hereby warned that all such infringements will be duly prosecuted."

"REGAN VAPOR ENGINES."—These engines have met with such general favor everywhere and the demand for them is growing so rapidly that the manufacturers have been obliged to establish works upon a larger scale in Chicago for their more speedy construction. This week 27 engines of various sizes were received at the works here, where they are set up and thoroughly tested before being sent out. With three more carloads on the way, the company will be enabled to fill their present orders promptly. The "Regan Launch," with engine specially adapted for it, is attracting much attention among boating men, and is pronounced by experts the most complete and perfect launch yet constructed. A large number are already in use and giving the highest satisfaction.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

SCIENTIFIC PROGRESS.

Vital Force—What Is It?

At a recent meeting of physiologists and surgeons at Chicago, a paper was read by Dr. H. J. Treat entitled: "Vital Force the Surgeon's Best Friend," upon which quite a lengthy discussion was held, from which we extract as follows:

Dr. Haast thought the paper a most excellent one. Had no criticisms to offer, and but one query to make, and that was with reference to an "Intelligent force" that has to do with the reparative process in surgery or medicine. The vital force had been talked of as an intelligent independence or an independent intelligence, an independent entity, an intelligent entity, etc. He thought that the matter should be well considered, in order not to make ourselves ridiculous in the eyes of intelligent, thinking men and women. He did not for one moment question the existence of a vital force, but that it existed as an independent intelligence he did seriously question. Vital force in his opinion was a property of matter. He thought that Dr. A. Curtis was not far from the truth when he said that "whatever always exists in connection with matter, but has no existence without it, is called a property of matter." Inasmuch, therefore, as "vital force" always exists in connection with living matter, and has never been found to exist outside thereof or independent thereof, it must be a property of living matter, and we can know nothing about vital force aside from living matter.

Dr. O. P. Fletcher queried: "What is vital force?" He had never yet heard it defined, and would like to know what it was. Had thought at times that it was intelligent. If you can find any force, not intelligent, that could bring together bones, muscles, nerves, blood vessels and all the various parts of this human machine, and put in working order and maintain it in that condition 50, 60 or 100 years, he would like to know its name and to know more about it. In college he was taught to believe that chemical force was not to be thought of as producing any of the results witnessed in the animal economy. It seemed to him now that life could not exist without chemical action.

Dr. Pechman remarked that our bodies are mysterious. Life and soul are used as synonymous terms by some. If the soul is the life, it is different from matter. The body is the house, the soul is the occupant. When life goes out, the house is left to decay. The bioplasm of plants and animals are, so far as can be ascertained by chemistry and microscopy, the same. Some of these bioplasms go to make bone, some form muscle, others form serous membrane, some skin, and so on through the whole body. When the man dies, his body is like to Mr. Jones' house—empty—something has gone out of it. The house still contains all the elements that were found in it during life, but there is something gone. This something is not a property of matter, but, as he viewed it, an intelligence—a something separate from the living matter.

Dr. Treat concluded that we can tell what vital force is as well as we can what life is, as well as we can tell what electricity is, as well as we can tell what gravity is. They are all known by their effects upon matter. It is only a play of words to say it is a property of matter. We know it is independent by its effects.

Dr. W. A. Harris remarked that the question put him in deep water. If a bone be broken, the vital force goes to work to repair the injury and reunite the parts. It looks and acts like it was intelligent. As to its being independent, I have nothing to say. It seems to have power to resist chemical force.

In reply it was said: A tree gets bruised by the woodman's ax. The living matter, by virtue of the inherent force in it, heals the injury. Is there an intelligence there?

Dr. Treat says there is a force or forces that overcome vital force—if it were not so, we would not die. Vital force is limited in its capacity to resist chemical force.

Dr. Scroggy said if the process of digestion be chemical and there was no vital force to resist it, the stomach itself would be digested.

[It may be remarked here that the reason why the gastric juice does not act upon the walls of the stomach is because that juice is acid, while the blood is alkaline. The walls of the stomach being well supplied with blood vessels, the gastric juice cannot act upon the stomach itself because the alkali of the one neutralizes the acid of the other.—EDS. PRESS.]

Dr. Pechman said that many in the profession hold that all changes that take place in our bodies are due to chemical force, yet some of these thinkers are changing their minds in this respect. When the vital force leaves the body, the chemical forces go to work to decompose it. The natural heat of the body is produced by chemical action of changing fluids into semi-fluids—all chemical action is attended with changes of temperature.

A NEW COMBUSTIBLE.—An experiment was successfully carried out at Rome recently, which will probably mark the commencement of a new era of prosperity for the mechanical industries of Italy, and especially for her carrying companies. A train was run from Rome to Frascati furnished with a new combustible

prepared according to the invention of Signor Saporiti of Siena. It is a preparation of lignite, of which there are immense and rich deposits in Italy. It is formed of two qualities—the xilolite and the schistos—of which the latter is the richer in combustible material. The train ran easily and smoothly up one of the steepest gradients of Italy. The quantity of fuel used during the transit was 367 kilogrammes, as against 300 of ordinary coal. The train was a heavy one of eight carriages and luggage van, and there were 70 passengers. An English gentleman said England would witness with pleasure the success of the experiment, and the commercial emancipation of Italy. A telegram was sent to the King announcing the success of the experiment. A very brilliant gas is also to be obtained from lignite. The importance of this new manufacture will be seen when it is remembered that Italy now pays from \$20,000,000 to \$25,000,000 yearly to other countries for coal, and that her supplies of lignite are practically unlimited. The smoke from the new combustible is very light and not disagreeable in odor.—*Chemical Trade Journal.*

The Edison Cosmical Telephone.

Some criticism has been attempted in regard to Edison's proposed cosmical telephone. It has been asserted that Mr. Edison "displays an ignorance of the principles of physics," in supposing that detonating disturbances in the sun can be heard through his cosmical telephone "while he waits"; because the movement of sound is so slow that it would require years to pass from the sun to the earth. The critics, however, have themselves manifested "ignorance" in regard to the principle upon which Mr. E. expects to receive those sounds. The "waves" through which Mr. E. expects to receive sounds from the sun are not "sound waves" but "electro-magnetic waves," which latter move with the velocity of light, and light requires only eight minutes to pass from the sun to the earth.

Solar disturbances give rise to electro-magnetic waves, which in turn are well known to cause magnetic disturbances on the earth, and it is Mr. Edison's expectation to change those magnetic waves into sound waves by means of his cosmical telephone; or at least to thereby make such waves audible. The movement of sound is not confined to the ordinary sound waves as produced in the atmosphere, as is proven by the ordinary action of the telephone. If a person speaks into a telephone at San Diego, he would not expect his friend to wait in San Francisco an hour for the sound to reach him. The well-known fact of the direct and almost instantaneous influence of solar magnetic disturbances upon the earth furnishes abundant evidence of direct electric communication between the two bodies, which line of communication Mr. Edison is endeavoring to take advantage of. These solar disturbances it is supposed will set up a varying electric current in Mr. Edison's wires with which he is surrounding his iron mountain, which passing through the helix of his telephone receiver, will cause its diaphragm to vibrate and thus convert the magnetic disturbance into audible sound.

This line of inquiry is certainly a most philosophical one and one of high scientific interest. The world will wait with impatient but hopeful interest for the final result.

TEMPERATURE TESTS IN BORED WELLS.—The method of taking tests of temperature in deep wells is shown in a late report of some tests taken by Mr. H. Halleck of the American Government Geodetic Surveying Corps, in the Boggs' Run well of the Wheeling (Pa.) Development Company. The well is now down to a depth of 4500 feet. The temperature tests at the well are taken twice a day, at 9 A. M. and 5 P. M. Reports from the different points in the well are secured by suspending three buckets, each 500 feet from the one next to it, in the well at one time. Each bucket is of copper, about 20 inches deep, filled with water in which two maximum thermometers are suspended. The buckets, which fit snugly to the sides of the hole, remain stationary for about 12 hours, and the heat from the surrounding strata in that time communicates itself through the buckets of water to the thermometers, where it is recorded. The highest temperature yet recorded is 110° Fahr., at the bottom of the well, and the average increase of heat has been found to be about one degree for each 78 feet of descent.

RAPE OIL.—According to the authors, rape oil consists of the glycerides of three distinct fatty acids, one of which, melting at 75°, occurs only in very small quantities. The other two, erucic acid and a liquid acid which the authors name rapinic acid, are present in equal quantities. Lead erucate is readily soluble in hot ether. The zinc salts of the fatty acids can be separated by means of ether.

PERSISTENCY OF ODORS.—When the mosque of St. Sophia, in Constantinople, was built, more than 1000 years ago, the stone and brick were laid in mortar mixed with a solution of musk, and the building, it is said, has been infected with the odor ever since. Probably age has imparted a musky odor from which the musk story was fabricated.

The earth is the greatest distance from the sun on the morning of the 6th of July.

MECHANICAL PROGRESS.

Stephanite—A New Alloy.

We recently drew attention to a process which promises well for the production of a new class of metal. This process consists in adding to iron or steel a certain proportion of aluminum, by which their characters are rapidly and very completely transformed, and their respective qualities greatly improved. Of course there is nothing new in this alloy, but there is everything new in the way it is manufactured by the process under notice. In adding aluminum to iron in the cupola in the ordinary way, the blast drives it off, and so the attempt is fruitless. So it has generally to be added in the ladle, stirrers being employed to secure the incorporation of the aluminum with the iron; but this, after all, is found to be only a mechanical mixture, and does not produce a reliable homogeneous alloy. The means of promoting the chemical mixture of the metals formed for some years a careful study with Mr. Stephan, of Birmingham, who unfortunately died a few months ago, before his invention had practically arrived at fruition. Mr. Stephan's idea was to form a flux of the raw material from which aluminum is made and to add it to the charge of iron in the cupola. In this way he had been successful in obtaining a chemical incorporation of the aluminum, and in securing some remarkable results. This flux, to which the name of "Stephanite" has been given, consists of alumina, emery and lime in certain proportions. They are incorporated and formed into briquettes. When the cupola is being charged with iron and coke, the briquettes are broken up, and about 80 pounds weight of the flux is added for each ton of metal. The high temperature of the furnace converts the alumina into metallic aluminum gases, which are absorbed by the molten metal in statu nascendi, and thus a complete chemical compound is formed. It is claimed for the flux that it acts as a clearing agent on the metal and draws every particle from the slag; that the molten metal comes from the furnace in a more liquid state than it has hitherto been found possible to obtain; that in consequence of this liquidity better castings are obtainable, and that, owing to the metal remaining at a high temperature for a considerable time, no blow-holes are formed. It is also claimed that by varying the proportion of the flux per ton of iron different results can be produced, that is to say, iron of different degrees of hardness and toughness can be made.

These claims were practically substantiated on Monday last, June 29, at Messrs. H. Young & Co.'s Foundry, Ecclestone street, Plimlico, in the presence of a number of gentlemen interested in metallurgical questions, including several from the colonies. Messrs. Young & Co. had only had Stephanite under trial experimentally at their works for about a week, but so satisfied were they of its merits, that on the day in question they placed their whole foundry at the disposal of the Stephanite Co., of Blomfield House, London Wall, all the castings being run from iron treated with Stephanite. Upon the occasion in question the cupola was charged with three tons of very poor cast-iron scrap, to which was added 240 pounds of Stephanite. The superior fluidity of the metal was evident directly after the cupola was tapped, and was further shown as the runs were made. After being allowed to set, some of the castings were taken out of the moulds and plunged at a dull red heat into cold water. With ordinary cast iron this treatment would have meant practical disintegration, either at the moment or when the metal received a blow. But disintegration took place at neither time with the new metal. When cold, one of the castings was broken in halves and showed a very good steely fracture. These castings resisted the file very completely. One of the halves of the broken casting was then heated to a cherry red in a smith's forge and then allowed to cool in the air. On again trying it with the file it was found quite amenable to its action. It was then placed in the forge, reheated, and again plunged into cold water, and when cool was tried with the file and no impression could be made upon it. The most important feature of this flux appears, however, to be that by its addition it is stated that wrought iron scrap can be reduced in an ordinary cupola, and owing to the free run and remarkable fluidity of the metal steel castings of the finest temper may thus be produced. The inevitable conclusion is that Mr. Stephan's method of incorporating aluminum with iron is a practical success, producing a metal combining the qualities of both iron and steel. This being so it follows that a wide field lies open for its application in many important directions. Beyond this Mr. Stephan has certainly added another and an important chapter to metallurgical science.—*London Iron.*

[To prevent confusion some other name should be given to this alloy to distinguish it from the mineral "Stephanite."—EDS. PRESS.]

A NEW STYLE OF CHAIN has been invented, which is cut directly from a bar of steel so that the links have no welds. In allusion to this improved mode of manufacture, a contemporary says: The manufacture of chains has been very much facilitated by the introduction of electricity for welding purposes, but a London firm has gone a step further and produced a chain which required absolutely no welding.

This is done in a most ingenious way. A cross-shaped bar of steel is drilled at proper intervals with holes, the size of which are dependent on the size of link required. The bar is then notched roughly to the shape of the links by suitable machinery, after which it is flattened to prepare it for the hollowing out of the links and their rounding up by stamping. In the next stage the links are punched through and parted, and the concluding operation is the cleaning and truing up of the links to their final form. The makers claim that the chains are considerably stronger than those made in the usual way. Apart from the possibility of defective welds, the fact that the new chain is of steel gives it a great advantage over ordinary chains, which, on account of difficulties of welding, are usually made of iron. It is stated that the new steel chain can be made equal in strength to the ordinary chain at a third-class weight.

CLEANING CAR WHEELS BY SAND.—We have heard but little of late in regard to the sand blast, but an exchange just received notices quite a new application of an important invention. Our contemporary says: A very efficient application of the sand blast is made in cleaning newly cast car wheels in the New York Car Wheel Works, Buffalo, N. Y. When taken from the soaking pit the wheel is rolled into a small chamber, where it stands in a vertical position. The tread of the wheel stands on rollers, which are moved by gearing so that the wheel is slowly revolved without changing its position. A fine, into which cinders are fed by a chute leading from a bin above, leads a blast of air against the face of the wheel, which is then reversed. The cinders used vary from the size of a grain of wheat to much larger, and are used over and over. With this apparatus one man can clean 20 wheels in three hours and a half, including the time consumed in rolling them to and from the machine. The cost is less than hand labor and the cleaning is better done.

THE MANUFACTURE OF HEAVY GUNS.—The manufacture of the immense guns required for modern service is a most interesting process. The rifled guns are made by re-enforcing the tube with rings and repeated layers of steel called jackets, which are fitted one over the other over the original tube or barrel of the gun. The exact size of the jacket and ring when heated so that it can be put in its place must be a matter of the closest mathematical calculation. The powder makes such havoc with the rifling of the largest guns that 100 charges are about all that can be expected from them. The jackets and rings can then be removed and fitted to another tube. The various parts of a gun are not put together at the foundry in Bethlehem, but are sent to Washington, to a department of the arsenal called the assembling room, where the tube is rifled, and the gun is finally completed. A steel gun of the largest caliber costs about \$100,000.

WHAT TO DO WITH DISHED WHEELS.—A newspaper reporter recently noticed a wheel of a two-wheeled road cart suddenly caught between two loose paving blocks in such a manner that it was instantly dished. While the owner was looking ruefully at his wheel, which was a new one, a policeman came up, and, calling on two or three onlookers to assist him, succeeded in pulling the tire into place and setting the wheel up as it had been. The owner, after thanking him, got in and drove off. "That is something that more huggy owners ought to know. If a wheel is dished without breaking the spokes off, it can easily be sprung into shape if three men will tackle it, and, catching hold of the tire at various points, give it two or three good strong pulls. That, said the policeman, makes five wheels that I have straightened that have been dished on this very corner."

STEAM ROAD CARRIAGES.—It is singular, says a contemporary, that when a steam carriage was made by Oliver Evans, of Philadelphia, nearly a century ago, no later attempts have been made to develop that line of invention. Steam engines have been applied to every other purpose conceivable, even to flying, but not to carriages for common roads until quite recently, when a French engineer has made one that is attracting a good deal of attention. There are, it is true, a good many obstacles such as the noise of the exhaust and heat, also the danger in crowded traffic, but these impediments can, no doubt, be overcome when steam carriages are known and wanted. Invention in this line is much more promising than that devoted to rotary engines, flying machines and many other schemes, in which large amounts of money are expended each year.

SHIP-BUILDING IN SAN FRANCISCO.—Having shown that war ships can be built in San Francisco, says a contemporary, it will soon be demonstrated that peace ships can be built as well, as a contract has been let for the construction of a 4000-ton iron steamer for the Pacific Mail Company, for use on the China route. The new ship is to be a fast vessel, her speed being promised at not less than 16 knots an hour.

OLD RAILS IN CAST IRON.—It is said that old rails will mix well with cast iron, giving strength and cleanliness, but usually around a foundry there are no appliances for cutting them into suitable lengths to admit of being placed in the cupola.

USEFUL INFORMATION.

Industrial Brevities.

Revolutions of all kinds, political, financial, commercial, manufacturing and social are threatening all over the world. The greatest revolution concerning which the least is said and the least understood is that revolution which will, when accomplished, bring about an enlarged consumption of all kinds of manufacturing products. It may seem strange to say it, but the world, that is the common world, is learning to eat more, wear more, live in better houses, and use more machinery. This revolution is extremely important in all its significances. Even in Europe, where habits of centuries have become fixed, there is a breaking away from old methods and ideas, expansion of demand, and a determination to have more of this world's goods. The same revolution is showing itself in certain parts of East India, China and Japan. Travelling commercial agents have noted it for a year or two. The world is forming new personal habits, and establishing new ambitions.

One of the marvels of industry in this country is the rapid progress which manufacturing industry is making in our extreme Southern States. The building up of a "New South" is a positive reality. During the last ten years fully 350 cotton mills have been built in the South. The Southern output of seed has trebled in ten years. English investors are buying large phosphate beds in Florida. Cotton gins, cotton compress works, and cotton seed oil mills are being built all over the South. Woolen and worsted mills are also going up. Georgia is taking the lead in cotton manufacture. Tennessee seems to be a very prosperous State for little industries of all kinds. A wave of industrial prosperity is passing over the State of South Carolina. One of the features of building operations in the South is the number of buildings for educational purposes going up.

Northern capitalists have invested a million dollars to cultivate a 112,000 acre farm in Florida, raising coconuts and sugar cane. Petroleum is to be developed on a large scale in Texas by German capitalists.

So far this year 2,352,474 tons of coal is the excess over last year. All the bituminous mines are doing very well.

Notwithstanding the flurry in the markets of the world, there is a stronger disposition to put money into legitimate channels than heretofore.

The capitalization of American railroads is about \$10,000,000,000, and the annual profits, \$1,000,000,000.

Fifty-ton-wheel locomotives to weigh 70 tons each, are about to be built for a New York railroad.

An iron and steel plant to make a hundred tons of steel daily is to be built at San Diego, California.

Boring for natural gas in Stockton is an enterprise that has become too common there to excite remark. The new \$30,000 courthouse is lighted and heated throughout by gas from a well bored by the county.

The Spreckles firm of Philadelphia and San Francisco recently had 53 loaded vessels due at the latter port.

BEES AND GRAPES.—The charge that bees bite grapes and thus gain access to the contents of their skins has been abandoned and the culprits of the industrious little workers now assert that the bee spits upon the grape a substance which eats away the skin. Experiments have been made by smothering bees up with no food but grapes and keeping them thus to the point of starvation, but they left the grapes whole, though running all over them and extracting every atom of moisture where one was already broken. If the bee was snub an effective spitter, then was the time for him to spit for dear life, but he starved without. The spit story needs verification.—*Cerrado Mercury.*

SODA WATER IN CUTTING STEEL.—A contemporary in answering the query, why soda water used in cutting steel leaves a smoother and brighter, surface than oil, answers as follows: "Because the soda water being more fluid than oil flows to the cutting edge of the tool and lubricates the cut. The soda as an alkali gives the water a greater affinity for the oily surface of both the tool and the steel, and causes it to flow between the point of contact of tool and metal. Its cooling power is also greater than that of oil, which can be seen by the heat carried off in vapor at the point of cutting."

PUTTING OUT FIRE WITH SAND.—In connection with the equipment for fire protection, of wood-working establishments, it is recommended that a gallon pail filled with fine sand, be always placed within convenient reach of each workman employed where oiling and finishing is being done. This practice might well be followed wherever there is a possibility of fire starting in oils or oil-soaked materials. There is nothing which will smother an oil-fed fire in its incipency more quickly and effectually than sand—and there are no afterlaps in the way of water drainage either.—*Fire and Water.*

LIGHTNING striking a dwelling in Belpre, Ind., strange to say, horned the gilt figures of the wall-paper without harming the white ones in the least.

GOOD HEALTH.

Freckles—Their Cause and Cure.

The annoying presence of freckles usually makes its appearance for the first time in summer. Freckles are always most marked in the summer months, but are seldom met with on portions of the body not exposed to the direct action of the sunlight. For these reasons, it is generally supposed their presence is due to the action of the sun's rays, although the precise mode of causation is not well understood. They often appear as early as the third or fourth year of life, and generally vanish with advanced age. Persons of fair complexions are most liable to them; but dark complexioned people are not always exempt. Their appearance is supposed to be due to an abnormal deposit of the natural coloring matter of the skin. Very likely much exposure to the sun under certain predisposed conditions of the subject leads to this increased deposit of coloring matter.

Their Removal.

Freckles may be rapidly removed by applications of snob strength as will give quick rise to the formation of minute blisters. The epidermis forming the roof of the blister contains all the disfiguring pigment, which will disappear with the removal of the epidermis. The new epidermis which will soon form over the surface thus treated will be free from any excess of pigment, and the freckles will thus disappear. But this process is not advised. It is quite too heroic, and its benefit will be only of short duration. Moreover, it may result in permanent injury to the skin, especially if the treatment is entrusted to unskillful hands.

Better results may be derived from milder and more prolonged treatment. Various ointments have been recommended which contain stimulating substances, that act by exciting a rapid formation of the superficial elements of the skin and their corresponding rapid scaling off (exfoliation). But even snob remedies should be applied only under the observation and advice of a competent medical man. The avoidance of sunshine would doubtless keep the development of this unpleasant appearance within reasonable bounds; but the avoidance of sunshine is attendant with so many of its own evils that it cannot be recommended. Mild remedies only are advised which will act slowly in removing the excess of coloring matter. Physicians recommend, in this direction, preparations of mercury, subnitrate of bismuth, and mild alkaline applications, such as solution of carbonate of soda or carbonate of potassium. These, variously combined with emulsions of almonds and tincture of benzoin, form agreeable remedies, which will have the desired effect if perseveringly used.

A Special Remedy.

A prominent physician of Brooklyn, New York, has prescribed an application for years and finds it more effective than anything else which he has recommended in his practice, says the *New York Recorder*. Here it is: One dram muriatic acid, three gills rain water, half-teaspoonful of spirits of lavender. Mix thoroughly. It should be applied twice the first day and then three times a day until the freckles disappear. At rising, before lunch and on going to bed are the best times for applying. Exposure to the sun and wind should be avoided as much as possible, and for some days a veil should be worn by the "patient" when she is out of doors. The mixtures should be applied directly to the freckles with a bit of soft linen or with a camel's-hair pencil. A very tender skin may at first be somewhat irritated, in which case an extra gill of rain water should be added, and a little cold cream used on retiring.

MICROBES OF THE STOMACH.—These conclusions are reached by Dr. Kianonski: The empty stomach of a healthy man contains innumerable organisms. The gastric juice, and principally the hydrochloric acid, possesses microbicidal properties. The microbes take no active part in digestion. Persons who on account of some affections secrete little hydrochloric acid are easily intoxicated by means of the micro-organisms in the stomach. Therefore, the stomach should not remain in an empty condition for any length of time, and during an epidemic food should be taken at frequent intervals, and, if possible, sterilized.

SCIENCE OVERCOMES DEAFNESS.—Just now the medical world is engaged in devising the new device for deafness called sound disk. No invention of late has attracted so much interest among the medical profession. Its perfection, which is now an established fact, has resulted in the overthrow of many pet theories of there being no relief for a vast number of cases of deafness. This ingenious discovery was made by H. A. Wales of Bridgeport, Conn., and coming as it does with the approval of some of the leading aurists of the world, it can hardly fail to prove of great value to both the profession and the afflicted.

TO FEED AN ORANGE to a sick person, cut it in half, crosswise; then, with a spoon, take out the fleshy part, containing the juice, rejecting the seed.

COOL THE BLOOD by drinking cold water in which a little pure cream of tartar has been dissolved.

ENGINEERING NOTES.

A STEAMSHIP STACK 120 FEET HIGH.—The latest plan to improve the draught of the furnaces of ocean steamers is to increase the height of the smoke pipes. The new steamer *Scott*, of the Cape Mail Line, is provided with smoke stacks 120 feet high above the grates, being the loftiest pipes ever put into a steamer. A draught of 3 inch water pressure is thus obtained, all the steam needed is easily secured, and the use of fans is dispensed with. Her speed is 19 knots. This steamer is 502 feet long, 54 feet 6 inches beam, 37 feet 6 inches deep. Tonnage 7,000. Built of steel. Fourteen watertight compartments, twin screws, 8,000 horse power engines, two sets of triple expansion engines, 34½ inches, 57½ inches, 92 inches by 60. The success of the tall chimneys of the *Scott* will probably lead to the trial of even higher pipes. The above vessel could not clear the floor of Brooklyn bridge, which is 119 feet above high water. If our great war steamers should be piped in accordance with the latest and best engineering practice, they will be debarred from the Brooklyn navy yard, unless they approach from the Hell Gate side of the great bridge. It was an error on the part of the Secretary of War to allow so low a floor for the bridge. At present all the larger ships are obliged to dismantle and lower their topmasts in order to pass under the Brooklyn bridge.

DESIGN FOR A VERY FAST STEAMER.—Messrs. James and George Thomson, Glasgow, have modeled a new steamer guaranteed to steam at the rate of 23½ knots an hour, which will enable the vessel to cross the Atlantic within five days. The vessel is to be about 630 feet long by 70 feet beam. The lines are very fine. The new vessel will have twin screws 22 feet or 23 feet in diameter, well supported. There are four funnels, and about 200 feet of the length of the ship is left for the boilers and hulkers. The engines are to be triple compound, with four cylinders working four cranks. They will probably indicate 33,000 indicated horse power. Accommodation is provided for 700 first and 300 second class passengers and about 400 emigrants, and all the arrangements worked out in the plans are far ahead, as far as regards luxury and comfort, of anything yet produced. The plating of the ship is carried up to the promenade deck, which runs from end to end, and a width of about 20 feet, on each side is left for walking. On the promenade deck are twelve machine guns, and in other respects the vessel is made suitable for an armed cruiser.

AN IMPORTANT TUNNEL.—The greatest engineering feat in the history of the anthracite coal mining is about to begin. It is the commencement of what will be known as the Jeddo Tunnel, which will be driven for the purpose of draining the flooded mines of Jeddo and Harleigh. It will be constructed from Butler Valley, Pa., to the bottom of Eberwade mammoth vein, a distance of three miles, through solid rock, to be eight feet square in the clear. The scheme of tunneling through the mountain first occurred to John Markle, who is to be president of the company, which will bear the title of Jeddo Tunnel Co., Limited. It will open an inexhaustible supply of coal and furnish employment for thousands of people for many years to come. It will also serve the double purpose of draining all the collieries in the valley.

ENGLISH AND AMERICAN SHIP BUILDING.—Mr. Charles H. Cramp is authority for the statement that it is entirely out of question for an American shipbuilder to duplicate exactly a British ship or follow out British specifications and plans, because American vessels are in advance, and there is no comparison when the outfit of the vessel is considered. Another important point which he makes is the fact that when a foreign shipbuilder is asked to duplicate an American ship, or build entirely on American plans, he always asks as much as an American builder. The whole summing up means that a contract for an inferior vessel will not be undertaken in England on competitive terms; but that our builders stand ready to duplicate first-class steamers at the same cost as abroad.

NIAGARA FALLS.—The utilization of the power of Niagara Falls is a fruitful topic of discussion in engineering circles. It is estimated that in supplying 120,000 horse power the depth of the water passing over the falls will be lowered about an inch, a mere trifle compared to the vast volume that leaps into the abyss below. Some idea of what 120,000 horse power means can be gleaned from the fact that large locomotive works in the East, giving employment to four or five thousand men requires 2500 horse power to drive the machinery.

PNEUMATIC TUBES.—It is proposed to establish mail tubes between Brooklyn and New York. This plan will be a good one, if it will cut down by about 36 hours the time of the mail between the two cities. Under present arrangements, a letter mailed in Brooklyn gets to New York any time within the next three days.

The Russian Government will spend 200,000,000 in building and equipping the Trans-Siberian railway.

ELECTRICITY.

ANTIQUITY OF THE ELECTRIC LIGHT.—Those who suppose the electric light to be a production of the present decade will be able to correct their apprehension of the subject after reading the following item from the *Scientific American* of Dec. 9, 1843: "The inventors of a new electrical light, exhibited at the Western Literary Institution, Leicester Square, London, on its recent reopening under the new auspices, expect, it is said, to apply it generally to shop and street illumination, and they state that while the conveying will cost no more than gas, the expense of illumination will be one-twelfth the price of the latter light. The current of electricity in passing through the two pieces of charcoal which form the poles of the circuit, and are excluded from all access of air, gives, in this case, it is said, an intense and beautiful white light, with the effect of daylight to a much greater extent than the lime does, and having this advantage, that it is sustained and continuous. If Messrs. Staites & Petrie can thus produce a steady and sustained light, they have accomplished what has hitherto been the sole preventive to the substitution of galvanism for gas. The *Mechanics' Magazine* states that this one light completely eclipsed ten gaslights and an oxyhydrogen. The gas companies had better look out. The dissatisfaction of the public with their mismanagement may have begotten a rival destined to eclipse many more than merely ten of their gaslights."

ELECTRICITY has been pronounced a success in capital punishment. Thus this country leads the world in an important feature of its penal system. This is the successful result of a movement begun years ago, when a commission of experts was appointed to investigate the subject with a view of finding some method of putting criminals to death less barbarous than hanging. No doubt other States will soon follow the example of New York, and in time England will substitute it for the gallows, France for the guillotine, Spain for the garrote and Italy for the sword. Electricity is destined to become the motor power of the world and the means of illumination, as it already is the agent of communication. Why should it not become in time the universal method of inflicting the death penalty?

AN EXTENSIVE ELECTRIC RAILWAY.—A high-speed electric railway is to be built between Chicago and Milwaukee, a distance of 85 miles. One of the projected systems of rapid transit in New York will cost \$50,000,000 for an 18-mile road. A speed of 40 miles an hour can be attained, and a 300-horse power electric locomotive will be used. In this connection, it may be stated that a ten-ton electric locomotive is being built at Lynn, Mass. If a ten-ton locomotive can be built, so can a 20-ton. The simplicity of mechanism and the total absence of all reciprocating parts makes the electric motor peculiarly adapted to the operation of a high-speed car, and to these features its decreased weight, in comparison with the steam locomotive, lends additional value.

AN ELECTRIC TRICYCLE.—There has been considerable discussion of late on the probable usefulness of an electric tricycle, and it is stated that the invention of such a machine is now an established fact. This, according to report, has been effected by the use of a form of storage battery much lighter than the kind hitherto used. Several of these placed in a light box are sufficient to drive the machine with an ordinary lad about 100 miles at the rate of eight miles an hour. The elements of the "active material" are supposed to be carried by the rider, and the batteries can be recharged whenever water is available.

ALTERNATE CURRENTS.—An electrician has recently completed some very important experiments on the physiological effects of alternate currents. He finds that the danger of the current diminishes as the number of alternations per second is increased. Thus it took 20 times as strong a current to kill a dog when the alternations were 4500 per second as when they were 120 per second. When the alternations were 300 per second, the current was only half as dangerous to life as when the alternations were 100.

DOVER, N. H., is one of the few towns in the country that operates its electric street railway system without the aid of a steam engine. The Salmon Falls river, which flows near the town, turns a 500 horse power water-wheel, which supplies power for the dynamos that operate the street line, the electric lights in the place, and electricity for several neighboring towns as well.

WHY IS IT SO?—Is it not a little strange that those who are so strongly opposed to the introduction of electricity for lighting purposes, because it is dangerous, still continue to use gas, which, according to statistics, causes many times more deaths than the electric current?

ELECTRIC MOTORS.—There are now running in Brockton, an inland town of Massachusetts, about 150 electric motors for shoemaking and other purposes.

BRUSSELS, an inland city, is ambitious of becoming a seaport. The plan is to build a ship canal from the North Sea.



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Passing Events.

The driving of the last spike on a local electric road this week is an event of moment, since this is the first of this type of roads to be built on the San Francisco peninsula, and will, when completed, be one of the longest electric lines in the United States. It is not yet in operation, but will shortly be.

The discovery of asbestos in Oregon is not of so much note as the steps being taken to work the deposit or ledge. There are numerous deposits of this mineral in this State, but few of them have been properly opened. It seems difficult to find large quantities which are up to the standard required by the manufacturers. The Oregon deposit will be worked vigorously from all accounts.

There is very little new to report concerning the gold industry of California. The quartz interests are moving along in a prosperous condition. The drift mines are being steadily worked, and in hydraulic mining nothing is being done except in the extreme north. There is no immediate prospect of the increase of the gold output of the State, but neither is there any danger of a decrease for the present.

An electric railway from San Jose to Redwood City is the latest franchise to be applied for at San Jose.

POLISHED plate glass is being used in Germany to replace lithographic stones.

Modern Mechanical Construction.

The result of the civil-service examinations for master mechanics and mechanics at the Mare Island Navy Yard did not show very brilliant results for local skill.

With reference to certain trades involving special training in building the hulls of modern steel war vessels, the board states that, in its opinion, none of the candidates presenting themselves possessed the special knowledge desirable. The trades referred to are as follows:

Master Shipwright—None of the candidates appearing before the board are fully qualified for the position, owing to their ignorance of iron and steel ship-building.

Master Shipfitter—None of the candidates appearing before the board evince that knowledge of machinery or machine tools that is desirable for this position, most of the candidates being plate iron-workers.

Master Shipsmith—None of the candidates appearing before the board evince that knowledge of modern smithwork in steel ship construction that the board deems desirable.

Master Plumber—None of the candidates appearing before the board evince that knowledge of plumbing and ventilation desirable in modern naval construction.

In view of these official statements concerning prevailing ignorance of modern work, it would be well for some of the younger men in the crafts to more thoroughly post themselves. One trouble with these people is, they are not readers. They potter along in the same old groove, and do not take the trouble to find out how the lines are advancing in their own trades.

If these men would regularly take and read one or two good mechanical journals, and buy a few of the many technical hooks, they could add to their practical knowledge much that would be useful to them.

There are four departments in which no first-class man appeared, and yet each is an important and leading branch. Of course, special training is necessary in building the hulls of modern steel war vessels, but as these vessels will continue to be built, the special training should be gained as soon as may be. If those now here do not qualify themselves, others from the East and abroad will replace such as are incompetent.

The mechanics of to-day to be abreast of the times should read more than they do. There are plenty of class publications, well edited and prepared, but they receive little support from the mechanics themselves. The "beases" in the trade patronize such journals, but the workmen as a class, seem to care very little for additional knowledge. They do not bother themselves to read of progress even in their own line. They expect their employers to tell them what to do. This is an unpleasant fact, and to this carelessness is due such incidents as recorded in the case of the examinations at the Navy Yard.

Platinum in California.

The chief source of supply of platinum is from the Ural mountains, in Russia, just as it has been for the past 25 years. The other sources of supply are not constant, except that portion which is held by the French in La Republica de Colombia, South America, whence a small amount is regularly received.

The only production in the United States is from California and Southern Oregon; mainly from this State. It is the result of the occasional saving of small placer mines. It consists principally of plat-iniridium, and also contains much iridosmine, some of which is separated for pen points, but the rest is melted in with the platinum.

It has been maintained that the price of platinum has been too low for many years; that platinum has been regarded as a tailing or refuse from gold placers, and therefore the cost of production has not been charged against.

It is pretty certain that if platinum were mined and worked out in the same way as gold, and the cost of producing and refining charged to the metal, it would cost as much as gold.

There is not such a very great difference now, as the metal has increased in value of late. This should stimulate the production of platinum in connection with placer gold mining in California. Too many miners are apt to overlook this important metal. Much of it is allowed to escape simply for want of care. At the advanced price now ruling, miners who are engaged in surface workings should look after their platinum closely and save all they can. It is very scarce and brings a good price, being always in demand.

Safety-Cap for Powder Kegs.

Wm. Mahoney of Santa Cruz has patented through the MINING AND SCIENTIFIC PRESS Patent agency an improved safety-cap for powder kegs, which consists of a disk or plate having tongues upon opposite sides, said tongues being adapted to lock into the sides of the opening which the disk is intended to cover. The top or end of the metallic powder-keg has an opening made through it. This opening is circular, with the exception of a short distance upon two opposite sides, where an inwardly extending portion occupies a small part of the circumference of the opening, and these two edges are raised slightly above the level of the rest at the opening to allow the lugs of the closing-cap to pass beneath them. The cap intended to close this opening is stamped out of soft zinc or other metal and has a circumference larger than the hole, so that, if made in the form of a complete disk, it would entirely cover the hole and approximately fill the countersunk depression which is made in the top of the keg surrounding the hole. At the sides of the disk, which correspond with the short inwardly extending portions of the hole, tongues are formed by simply cutting out a triangular section upon each side. The plate is then bent into segmental or semi-cylindrical form, and the ends of the projecting tongues are introduced beneath the inwardly extending portions of the sides of the hole. By pressing upon the inwardly curved portion of the cap after these tongues are thus introduced the cap will be flattened down and the tongues will lie beneath the inwardly extending portions, and the corners or angles which have been cut out of the plate on each side allow the plate to be flattened down, so that it entirely covers the opening into the keg, thus forming a securely locked cap, which can only be removed by again bending it into the semi-circular form by means of any suitable tool, which may be introduced beneath the overlapping edges of the cap. The inwardly extending portions at each side of the hole, and beneath which the tongues of the cap are locked, are forced slightly upward in stamping out the head and the hole so that the tongues of the cap will readily pass beneath them and at the same time allow the cap to lie perfectly flat upon the top of the keg when pressed down to its seat.

The World's Fair.

It cannot be said that any very active steps have yet been taken by this State toward preparing for the Chicago World's Fair. The Legislature appropriated \$300,000, but the State Controller makes some difficulty about getting any of the fund for the present. A few individuals are making preparations and the State Commission is considering the offices, but as for collecting material, or arranging for its collection, little is being done. The State Commission this week passed the following resolutions:

WHEREAS, In order to secure uniform effort throughout the State of California in the various counties in arranging their exhibits for the World's Columbian Exposition, it is necessary to perfect organizations in each of the counties formed on the same general plan; and

Whereas, In order to make this Commission the channel through which all information shall pass with regard to all exhibits, both in the State building and in the general exhibition buildings, it is expedient to suggest a plan under which such organizations shall be formed; therefore be it

Resolved, That this Commission proceed at once to the work of forming a World's Fair Association in each county of the State, and that a set of by-laws or form of government be suggested by this Commission for each of such associations; and be it further

Resolved, That the Secretary be authorized and instructed to draft a plan at once, to print and distribute sets of by-laws in accordance with such plan, and have engraved and distributed certificates of membership for the use of said county associations, charging therefor a sufficient sum to cover all costs to this commission.

The active and energetic leading men in the various counties should take time by the forelock and consider what shall be done. There is no time to be lost. Each county to be well represented will have to have wide-awake committees who show an interest in the work.

Meantime while there is considerable talk about candidates for the office of Chief of the Horticultural Department, we do not note any remarks before the Commission concerning a mining display.

New Books.

The "Young Engineer's Own Book," by Stephen Roper, contains an explanation of the principle and theories on which the steam engine as a prime mover is based; with a description of different kinds of steam engines, condensing and non-condensing, marine, stationary, locomotive, fire, traction and portable, together with instructions how to design, proportion, repair and run all classes of steam engines. There are also tables and formulae for finding horse power, suggestions for care and management of engines, etc. This little work is for the use of educational institutions where students are intended to engage in mechanical pursuits, and for the private instruction of youths who show an inclination for steam engineering. The book is published by Edward Meeks of Philadelphia, and for sale by Osborn & Alexander of this city: price \$3. It is one of Roper's practical hand-books, substantially bound and of such form that it can be carried in the pocket. The information is in a condensed but readable form, elementary in its nature.

Another new work, by the same author (Stephen Roper), is "Roper's Engineer's Handy Book." This contains full explanation of the steam-engine indicator and its use and advantages to engineers and steam-users, with formulae, facts, figures, questions, tables, etc., for engineers who wish to qualify themselves for the U. S. Navy, revenue service, mercantile marine, or to take charge of the better class of stationary steam engines. This is the 11th edition of this work, which is intended to inform people how to take care of and manage engines intelligently and to furnish a plain, practical treatise. The plainest language is used and as few mathematics as possible. In the discussions brevity has been adhered to, everything being condensed. The work is well illustrated and printed, and in flexible binding suitable for the pocket.

"Retaining Walls for Earth" is the title of a book by Malver A. Howe, published by John Wiley & Sons. This is a revised and enlarged second edition. It includes a discussion of the theory of earth pressure as developed from the ellipse of stress, with an appendix presenting the theory of Prof. Weyrauch. The values of various co-efficients have been computed and tabulated, very materially decreasing the labor of substitution in the formulae. The introduction of a brief treatment of the supporting power of earth in case of foundations, as well as formula for determining the breadth of the base of a retaining wall, should prove acceptable. The work is one of great value to the educated engineer.

Oregon Again to the Front.

"Why, young man, we have got a whole mountain of that stuff up at my place," was a remark made about one year ago by a farmer living in Josephine county, Oregon, to a gentleman who was showing crude asbestos from which the asbestos roof paint is made.

Little did the gentleman who made the above remark think that within a twelvemonth it would lead to the discovery of one of the most extensive beds of this valuable mineral that has yet been found, and that it would likely open an entirely new manufacturing interest for the State of Oregon.

Such, however, was the case. The remark was made to Mr. G. W. Bacon, who at once investigated the matter and made a filing. Mr. A. Tyler, of Forest Grove, a prospector of much experience, who was in the neighborhood looking after other mining interests, had his attention called to the find, and at once set about investigating it. The work was done very quietly and thoroughly, and has resulted in Mr. Tyler's filing by power of attorney for a number of wealthy Portland gentlemen on nearly a section of land. Capitalists from Puget Sound have also become interested in the find, who, together with the Portland parties, have formed a company to be called "The Puget Sound Asbestos Company," which represents a capital stock of \$500,000. The company will have its main office at Vancouver and will take active steps to develop its property.

Machinery for the reduction of the crude material will be run by water-power, and employment will be given to about 100 men.

The asbestos comes from the ledge in strips, and about 70 per cent is pure asbestos. The vein is eight inches in width and runs continuously for about three-quarters of a mile. It is supposed that there is much more of the mineral in the immediate vicinity, and it is needless to say that there is much excitement.

Oregon has recently come to the front with the largest cave on record, and now she claims the banner asbestos mine. Nature has done nothing by halves in the State, and if the people will meet her half way, untold riches will be revealed in her mineral wealth as well as in the development of mineral springs of medicinal value, which exist in abundance, and in many other ways that will be of material benefit to the State and nation.

G. W. S.

Condensation of Coke Oven Gases.

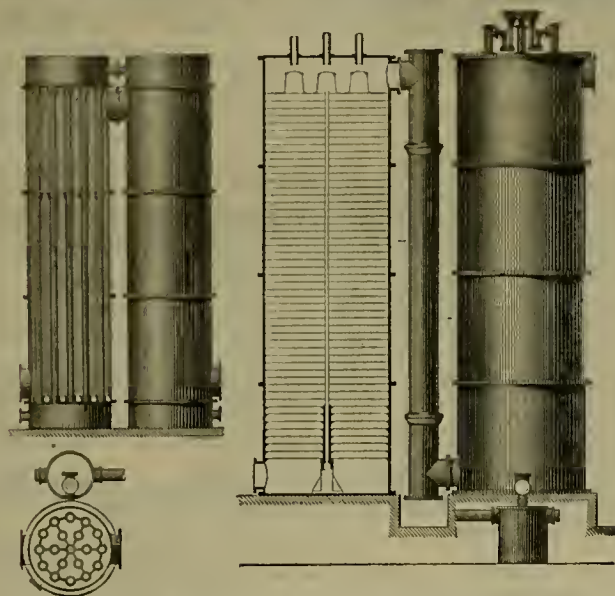
In the PRESS of last week were given sections and plans of regenerative coke ovens used, in Upper Silesia, in connection with condensing apparatus to obtain the by-products from the

and in the side walls 1100° to 1200° C., show, as a rule, at the foot of the heating-flues, over 700° C. still. When they finally escape, therefore, from the flues, they carry so much heat that they have been further used under steam-holders with other fuels. Often (and especially

latter portion in the heating of blast. The gases, which are tolerably free from dust and ashes and give a high calorific effect, are burned in brick heating-stoves (Cowper stoves). This has furnished a remedy for the difficulty encountered in Upper Silesia by reason of the

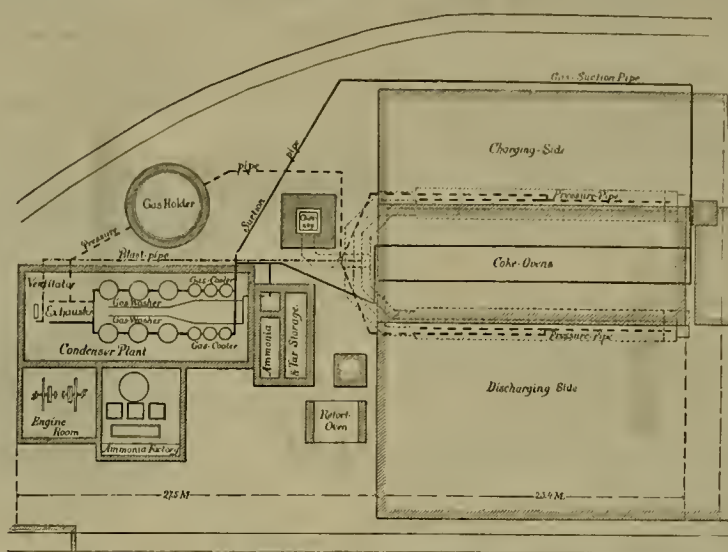
and traversed by an intermittent current of electricity, vibrates and becomes subdivided in a series of waves having well marked neutral segments and nodes.

A CHEMICAL LIGHT NEWLY NOTED.—It has



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gases of coking. We give herewith a longitudinal section of one of the regenerative coke ovens for saving by-products, and engravings of the condensing apparatus.

At many works tar and ammonia (which latter is usually converted at once into sulphate) are separated from the coke-oven gases by condensation. But this is not by any means the last word of progress in that direction, for a whole series of by-products are obtained by means of the condensing apparatus. The gases which remain after the condensation consist essentially of light hydrocarbons, and are approximately free from oxygen and nitrogen, especially if the ovens are so well built and maintained that the entrance of atmospheric air into the coking spaces is completely prevented. These gases are further utilized in heating—primarily the coke ovens themselves, under the floors and between the walls of which they are conducted. But the gases are, after the condensation is over, so far cooled that they will scarcely ignite spontaneously, and once ignited do not continue to burn freely. Hence, either the gases or the air which is to burn them, or both, must be pre-heated. If the ammonia from the first condensation is too weak, it is enriched on gas-washers until the ammonia water shows 3° to 3½° Beane.

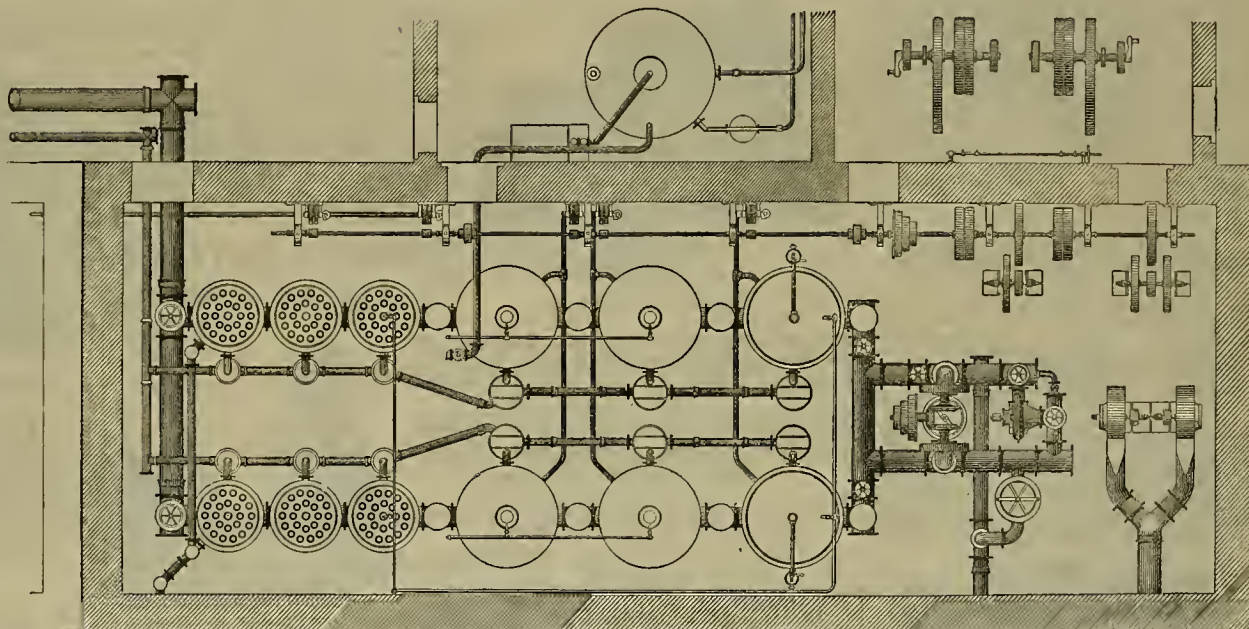
The gases, the temperature of which is in the floor-flues of the ovens 1200° to 1400° C.,

in upper Silesia) the quantity of gases is so great that a small part suffices to support the coking, while the rest can be otherwise utilized. Mr. Bremme, an engineer at Jullenhutte, has succeeded in finding, after the separation of the gases, a very advantageous use for the

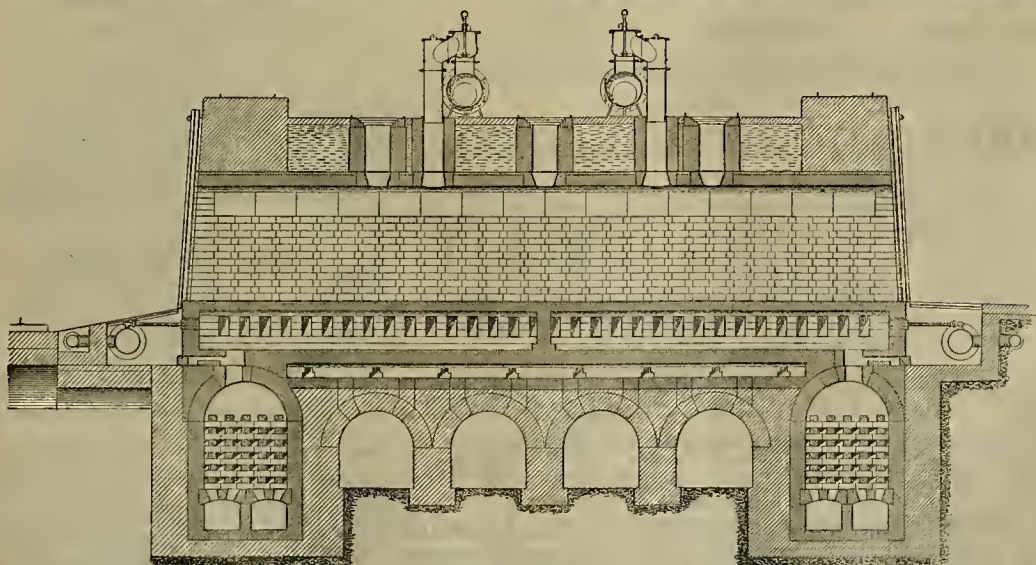
large amount of zinc-dust in the blast-furnace gases usually employed to heat the hot-blast stoves.

ELECTRICAL EXPERTS state that a stretched platinum wire, when heated to incandescence

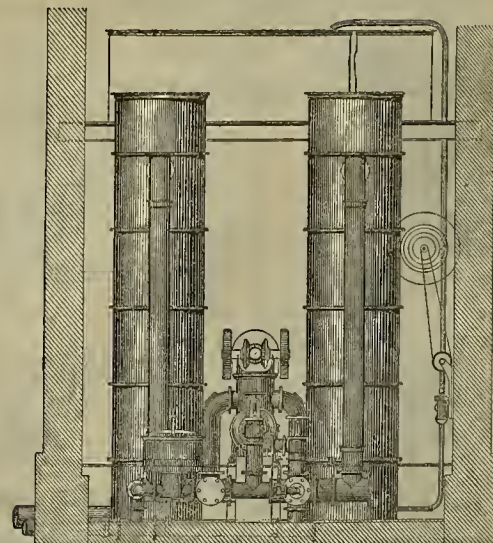
recently been observed, says the New York Times that when liquid carbonic acid is allowed to escape into a stout canvas bag in the dark, and by its expansion to freeze into a snowy mass, the effect is accompanied by a pale, greenish-violet light and electric sparks.



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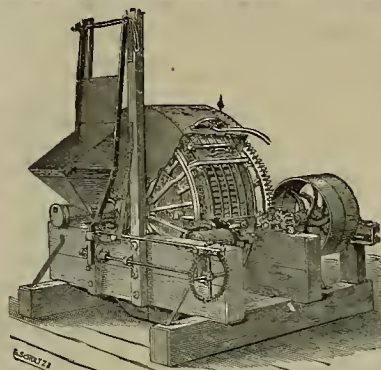
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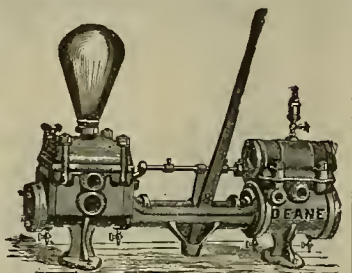
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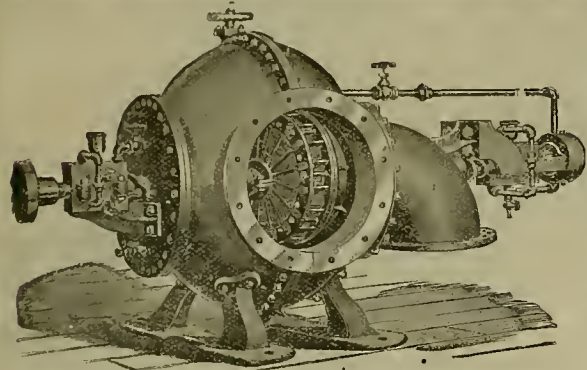
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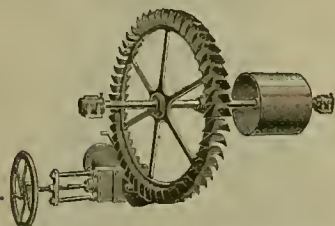


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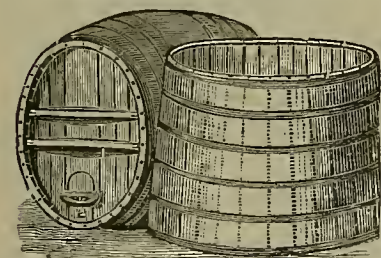
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 30, 1891

General trade continues dull, but not more so than usually obtains at this season of the year. The grain crops are turning out larger than many well-informed parties had estimated. They are not only larger, but of excellent quality. At the East, all advices continue favorable, with crops large and prices good. Throughout the United States, encouraging advices are at hand. The only seeming drawback is continued discussion of, and a demand by, a large and growing organization for a change in our financial system.

QUICKSILVER—Receipts the past week aggregate 161 flasks, and shipments by sea 30 flasks. The market does not present any new features worthy of particular mention.

MEXICAN DOLLARS—Heavy receipts and an offish demand cause a slow market to obtain at from 78 to 79 cents.

SILVER—The market is strong at around \$1 per ounce. At the East, the prevailing opinion is that there will be a gradual strengthening, with fluctuations, until prices reach the highest point touched in 1870. Some even go a step further and claim that par will be reached by the time Congress meets. While it is possible for \$1.29 3/4 to be realized by December, yet it is quite certain that much better prices will obtain than are now current. The market in Europe, while somewhat unsettled, still has symptoms of steadying and advancing. It is not at all unlikely but quite a short interest exists, which, if correct, may aid very materially in sending prices to much higher figures. The India demand ought to set in soon.

LIME—Receipts the past week aggregate 3,085 bbls. The shipments by sea are fair, while the home demand is quite active.

ANTIMONY—The market in sympathy with the East is weak, with concessions obtainable.

TIN—The demand is slow, with concessions obtainable. Receipts overlaid the past week, aggregate 450 boxes plate. Late English cables report pig lower, but plate firmer under a slight increased call. The works have not started up.

COPPER—The market is still settling. New York advices report increased, selling offers which unfavorably affect the market. *Iron Age*, London cable, July 23rd, reports: "Copper prices receded about 1/2 during the week, under the influence of free offering of forwarders in quite large blocks and realizations by small holders. The recent selling, it is believed, has created a considerable short interest that may be an important factor later on. The visible supply has increased somewhat. Chili charters first half of the month were 500 tons. Sales of furnace material are lot. The latest included 800 tons Montana Matte at 105¢.

IRON—Imports of pig the past week aggregate as follows: Liverpool 500 tons, New Castle (Eng.) 500, Oregon 75. Total 1,075 tons. Our market is unchanged. The consumption is said to be fully 20 per cent more than it was at the like time in 1890. English advices report stronger outward freights which inspires more confidence with holders here.

COKE—Imports the past week aggregated 4751 tons from England. The market is being shaded on quotations.

COAL—Imports the past week aggregate as follows: Overland, 62 tons; Coos Bay, 150; Comox, 4300; Tacoma, 2200; Cardiff, 1133; Newcastle (Eng.), 1000; Newcastle (N. S. W.), 2034; Baltimore, 2004; Greenock, 3775; Seattle, 756; Nanaimo, 4586; Departure Bay, 5845; total, 29,845 tons. The spot market is strong with an increasing demand for all grades. The consumption is claimed to be the largest on record. Consumers still maintain the belief that with a growing output of the, Puget Sound mines, the market will not advance. This opinion is further strengthened by the large tonnage with foreign on the way and to land.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

DAVIS PILE-CASING CO., July 13. Object, to purchase and sell devices for protecting piles from the terebdo. Directors—Edward Davis, N. A. Jones, J. H. Currie, J. C. Nealon, J. J. Schriener D. McNea and E. M. Morgan.

BERKELEY AND LORIN WATER & LIGHT CO., July 13. Capital Stock, \$250,000. Directors—W. L. Sheldon, W. F. Martin, J. A. Mallin, J. Purcell and C. W. Elting.

ESTRELLA DE ORO DRYING & PACKING CO., July 13. Directors—S. P. Burdick, A. W. Burdick, A. M. Sutton, J. M. Merrill and Bernha S. Shafter. **PACIFIC COAST NATURAL GAS, OIL & MINERAL CO.**, July 15. Capital Stock, \$100,000. Directors—E. E. Perley, E. J. Beane, Geo. T. Dunlap, N. K. Spect and J. W. Dunlap.

MATSON FRUME CO., July 15. Object, the manufacture and publication of educational appliances and books. Capital Stock, \$500,000. Directors—Fannie L. Matson, Mary E. Arnold, Geo. H. Fuller, Wm. R. Dangerfield, W. F. Gibson, Emma J. Arnold and Henry E. Pastor.

SUNNYSIDE LAND CO., July 15. Capital Stock, \$1,000,000. Directors—B. Joost, P. Rohrbacher, F. F. Moulton, W. W. Connor and Rudolf Mohr.

Eastern Metal Markets.

By Telegraph.

New York, July 30.—The following are the closing prices the past week:

	Silver in Silver	Copper.	Lead.	Tin.
Thursday...46 1/2	100 1/2	12 50	4 37 1/2	20 60
Friday...45 1/2	100	12 46	4 37 1/2	20 70
Saturday...45 3/4	99 1/2	12 45	4 37 1/2	20 65
Sunday...45 13/16	100 1/2	12 40	4 40	20 60
Tuesday...45 13/16	100 1/2	12 35	4 40	20 40
Wednesday...45 13/16	100 1/2	12 30	4 40	20 40

Copper continues to recede under heavy supplies. Lead is fairly firm, as is tin. Quicksilver is steadier. Antimony is still shading. Borax is fairly firm.

Mining Share Market.

Comstock mining shares the past week exhibited more life than for several weeks, and the way in which some of the shares jumped up and fell back threw the chipping fraternity into a chaotic state of mind that must have pleased the master General in command of manipulating the stocks. Some of the moves that were looked for did not materialize, while others, not looked for, came and vanished in a day's time. Such rapid ups and downs bring prominently forward cappers and "camp followers" who are filling the air with rumors. They generally give out to one set of outside operators a bull move, to another a coming break, and to still another they say, "Let them alone, for it is not time to enter the market." The point that proves correct and out of which the operator makes a profit, a "div" is expected, but they forget to look after the losing point. There is no denying but the market has an exceedingly healthy tone, but how the pool's managing manipulator will work it from day to day, or even week to week, is beyond the writer's knowledge, but what we do claim to know is that the conditions never so well favored a bull campaign as they do at the present time.

Briefly stated, they are as follows: Mining shares are closer concentrated than for years. The money market is not only easy but promising to be unusually easy before "the snow flies," under large crops, good prices and farmers selling, which always stimulate every other industry, and last, but by no means the least, a certainty that the next Congress will pass a free coinage bill.

Besides the above, the fact must not be lost sight of that the mines from Utah to Caledonia, or, in other words, from one end to the other, were never before in as good condition for exploiting and developing work. There are drifts, crosscuts, shafts, etc., from one end to the other, and unlike in former years, the managers of the different groups of mines appear to be working in harmony.

The Chollar Mining Co.'s returns for June report are as follows: "Average assay of the ore per ton, \$20.69; 65 per cent of assay, \$13.44; gross average per ton, \$13.74; net average per ton, \$5.74; per cent worked, 65." Where does the one-third go? Is it not about time that the reported controller of this middle group of mines look after this big leak? But then perhaps the powers have it so arranged that the leakage runs into their already overflowing bank account.

The share market opened strong this (Thursday) morning with Potosi and Bullion in the end. After Call, Gould and Curry led, then eased a little, when Ophir came to the front. The public is looking for a weaker market next week, this feeling is emphasized by confirmed reports that the Morgan mill will stop running on Con, Virginia ore and run the tailings. It is currently believed that the latter are very rich, being confiscated through the milling process peculiar to the Comstock, of course Con. (should be confiscated) Virginia shareholders do not share in the profits from the tailings, or at least, so says current report.

The *Territorial Enterprise* in quoting the PRESS of July 25th, is mistaken about our not giving it credit for the Sierra Nevada article, for the quotation marks show that we did. Our assertion that ore was found in the west working of the North End mines will be verified when the time comes to start the Union Con. pump. At that time we will have something more to say about the west workings, of the North End mines, and copies of surveys will be forthcoming to verify our statement in last week's paper and that actual work was done in the mines, and which was paid for by assessing stockholders. Covering up ore holes while stockholders were being "froze out" of their stock is not a very modern accomplishment of Comstock managers. It is at least 12 years old. What has the *Enterprise* to say about the west workings in Savage, Hale and Norcross and Chollar? The E-street tunnel connects with the Sinaloa shaft and we contend that the west ledge is fully exposed in those mines from the 1400-foot level up to the surface. We now urge upon Mr. Levy & Co. to open out the west workings of those Middle mines. Those supposed secret workings are common property. Con. Virginia will probably declare a dividend about the 10th of August.

San Francisco Metal Market.

WHOLESALE.		THURSDAY, July 30, 1891.	
ANTIMONY	— @	15 1/2	—
BORAX—Refined, in carload lots	8 @	—	—
Powdered	8 @	—	—
Concentrated	7 1/2 @	—	—
All grades jobbing at an advance	—	—	—
COPPER—	—	—	—
Bolt	22 @	—	—
Sheeting	22 @	—	—
Ingot, jobbing	—	15	—
do, wholesale	—	14 1/2	—
Fire Box Sheets	22 @	24	—
LEAD—Fig.	22 @	—	—
Shot	22 @	—	—
Sheet	22 @	—	—
Pipe	22 @	—	—
Shot, discount 10% on 500 bags Drop, 1/2 bag	1 90 @	—	—
Enck, 1/2 bag	2 10 @	—	—
Ohlled, do	2 30 @	—	—
QUICKSILVER—By the flask	40 00 @	42 00	—
Flaska, old	40 00 @	40 00	—
CHROME IRON ORE, 1/2 ton	10 00 @	—	—
IRON—Bar, base	3 @	34	—
Norway, base	3 @	34	—
STEEL—English, lb.	16 @	20	—
Canton tool	9 @	9	—
Black Diamond tool	9 @	9	—
Pick and Hammer	8 @	10	—
Machinery	4 @	5	—
Toe Calk	4 @	4	—
TIN PLATE—B. V., steel grade, 14x20, spot	6 50 @	—	—
Charcoal, 14x20	23 00 @	—	—
do roofing, 14x20	6 00 @	—	—
do, do, 20x23	13 00 @	—	—
Pig tin, spot, 1/2 lb., irregular, nominal	13 00 @	—	21 1/2
IRON—Glengarnock ton	30 00 @	—	To Load.
Eglinton, ton	23 00 @	—	27 @
American Soft, No. 1, ton	—	43 00	30 @
Oregon Pig, ton	—	30 00	30 @
Fugate Sound	30 00 @	—	30 @
Clay Lane White	26 00 @	—	24 @
Shotts, No. 1	30 00 @	—	29 @
Langlois	23 00 @	—	26 @
Fluorcliff	23 00 @	—	26 @
Cartsbarrie	23 00 @	—	26 @
Barrow	23 00 @	—	26 @
Cargodiet	26 00 @	—	26 @

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COMPANY AND LOCATION.	NO.	AMT. LEVIED, DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Best & Belcher M Co., Nevada.....	49.....	June 23, July 23, Aug 18.....	L Osborn.....	309 Montgomery St
Bullion M Co., Nevada.....	30.....	July 16, Aug 20, Sept 3.....	E R Grayson.....	331 Pine St
Chollar M Co., Nevada.....	30.....	July 14, Aug 18, Sept 3.....	C E Elliott.....	309 Montgomery St
Clara Cons M Co., S. Dakota.....	4.....	June 2, July 20, Aug 15.....	A Cheminant.....	328 Montgomery St
Cons Pacific M Co., California.....	13.....	June 1, July 11, Aug 6.....	F E Luty.....	310 Pine St
Crown Point M Co., Nevada.....	35.....	July 9, Aug 13, Sept 3.....	J Newlands.....	331 Pine St
Cruikshank M Co., California.....	2.....	July 7, Aug 17, Sept 7.....	E J Koch.....	211 Sansome St
Evering Star M Co., California.....	2.....	June 25, July 30, Aug 20.....	J J Scoville.....	320 Sansome St
Exchequer M Co., Nevada.....	31.....	July 21, Aug 27, Sept 17.....	C E Elliott.....	319 Montgomery St
Golden Fleece Gravel M Co., Cal.....	15.....	June 30, Aug 12, Sept 19.....	W J Gleason.....	319 Montgomery St
Golden Jacket M Co., Nevada.....	4.....	July 9, Aug 13, Sept 12.....	R G McCallan.....	331 Montgomery St
Gould & Curry M Co., Nevada.....	67.....	June 2, Aug 25, Sept 17.....	A K Durbrow.....	309 Montgomery St
Gray Eagle M Co., California.....	24.....	June 9, July 14, Aug 4.....	A W Barrows.....	303 California St
Justice M Co., Nevada.....	38.....	July 11, Aug 15, Sept 4.....	R E Kelley.....	419 California St
Justice & Wadsworth M Co., Nevada.....	26.....	July 21, Aug 14, Sept 21.....	A E Cooper.....	324 Montgomery St
Mineral King M & M Co., Arizona.....	8.....	June 24, Aug 1, Aug 25.....	J T Norman.....	419 California St
Northwestern L & M Co., Br. Columbia.....	3.....	July 18, July 31, Aug 24.....	F Bonacina.....	438 California St
Potosi M Co., Nevada.....	36.....	July 21, Aug 25, Sept 15.....	C E Elliott.....	309 Montgomery St
Saratoga M Co., Nevada.....	1.....	June 20, July 24, Aug 12.....	W R Draks.....	109 California St
Savage M Co., Nevada.....	4.....	July 16, Aug 13, Sept 7.....	E B Holmes.....	309 Montgomery St
Scott Bar M Co., California.....	4.....	July 20, Aug 23, Sept 21.....	H P Pink.....	309 Montgomery St
Seig Belcher & Mides Cons M Co., Nev.....	8.....	June 16, July 20, Aug 10.....	E H Holmes.....	309 Montgomery St
Smith M Co., California.....	2.....	June 27, Aug 14, Sept 18.....	C E Wiggin.....	19 C Farrell St
Terraform M Co., California.....	6.....	July 11, Aug 11, Sept 5.....	W J Garnett.....	305 Pine St
Treadwell Co Development Co., Cal.....	7.....	July 10, Aug 21, Aug 31.....	C T Hernau.....	332 Kearney St
Valley View M Co., California.....	3.....	June 16, July 20, Aug 12.....	W J Garnett.....	305 Pine St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Derbie Blue Gravel Co., California.....	J. Wetzel.....	320 Sansome St.....	Annual.....	Aug 4
Humboldt M Co., Nevada.....	J. O. Riddock.....	35 New Montgomery St.....	Annual.....	Aug 24
Julia Cons M Co., Nevada.....	J. Stadfield.....	309 Montgomery St.....	Annual.....	Aug 16
McKullen M Co., Nevada.....	J. P. O'Brien.....	328 Montgomery St.....	Annual.....	Aug 16
Mineral King M Co., Arizona.....	F. Norman.....	419 California St.....	Annual.....	Aug 12
Monte Christo M Co., Nevada.....	L. Leavitt.....	633 Kearny St.....	Special.....	Aug 17
Mountain Tunnel Gravel Co., Cal.....	E. O. Landis.....	219 Sansome St.....	Annual.....	Aug 4
New York M Co., Nevada.....	C. E. Elliott.....	309 Montgomery St.....	Annual.....	Aug 1
Silver West Cons M Co., Nevada.....	A. A. C. O'Brien.....	414 California St.....	Special.....	Aug 10
South Feather W & Union M Co., Cal., J. Coma.....	.....	220 California St.....	Annual.....	Aug 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co., Nevada.....	J. Wetzel.....	320 Sansome St.....	10.....	July 15
Cons Cal & Virginia M Co., Nevada.....	A. W. Havens.....	309 Montgomery St.....	50.....	July 10
North Banner Cons M Co., California.....	T. J. Mitchell.....	Grass Valley.....	50.....	Aug 20
North Commonwealth M Co., Nevada.....	J. W. Felt.....	310 P. Pine St.....	25.....	July 17
South Feather W & Union M Co., Cal., J. Coma.....	.....	220 California St.....	100.....	July 10

wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 9.	WEEK ENDING July 16.	WEEK ENDING July 23.	WEEK ENDING July 30.
Alpha.....	.70	.65	.75	.60
Alta.....	.70	.80	.70	.65
Belcher.....	1.30	1.40	1.10	1.25
Belle Isle.....	.70	.60	.75	.60
Best & Belcher.....	2.30	2.50	2.00	2.10
Bullion.....	2.40	3.00	2.20	2.30
Bodie Cons.....	.60	.50	.60	.50
Bulwer.....	.50	.65	.55	.30
Commonwealth.....	.60	.60	.60	.45
Con. Va. & Cal.....	6.00	6.25	5.62	6.75
Challenge.....	.25	.10	.90	1.10
Chollar.....	1.75	1.95	1.60	2.20
Confidence.....	3.60	3.95	4.00	2.90
Con. Imperial.....	.10	.10	.10	.15
Caledonia.....	.50	.40	.50	.40
Crown Point.....	1.30	1.10	1.30	1.10
Crocker.....	.10	.10	.10	.10
Del Monte.....	.30	.30	.30	.30
Eureka Cons.....	3.10	3.00	3.00	3.00
Exchequer.....	.60	.75	.50	.60
Grand Consolidated.....	1.30	1.40	1.20	1.30
Gould & Curry.....	1.30	1.40	1.20	1.30
Hale & Norcross.....	1.75	2.00	1.60	1.95
Julia.....	.15	.10	.15	.15
Justice.....	.30	.40	.35	.40
Kentuck.....	.30	.25	.25	.25
Lady Wash.....	.20	.25	.20	.20
Mon.....	.60	.60	.60	.45
Mexican.....	2.15	2.25	1.50	2.15
Nevada.....	.30	.30	.30	.30
North Belle Isle.....	.50	.40	.40	.55
Nev. Queen.....	.20	.30	.20	.20
Occidental.....	1.10	1.15	1.10	1.00
Ophir.....	3.10	3.20	3.10	2.55
Overman.....	2.10	2.20	1.90	2.10
Potosi.....	3.80	4.95	3.60	4.60
Poorless.....	.10	.10	.10	.10
Peer.....	.40	.40	.40	.40
Savage.....	1.60	1.70	1.25	1.65
S. B. & M.....	.60	.45	.55	.40
Sierra Nevada.....	2.10	2.15	2.00	2.15
Silver Hill.....	.20	.20	.20	.25
Scorpion.....	2.05	2.10	1.80	2.05
Union Cons.....	.65	.60	.65	.50
Utah.....	1.70	1.75	1.50	1.70
Yellow Jacket.....	1.70	1.75	1.50	1.70

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THURSDAY, July 30, 9:30 A. M.
250 Alpha.....9 @ 95c
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300 Andie.....1 @ 1.05
200 Belcher.....1 @ 1.65
220 Best & Belcher.....3 @ 3.10
700 Bullion.....3 @ 2.40
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350 Challenge Cons.....1 @ 4.50
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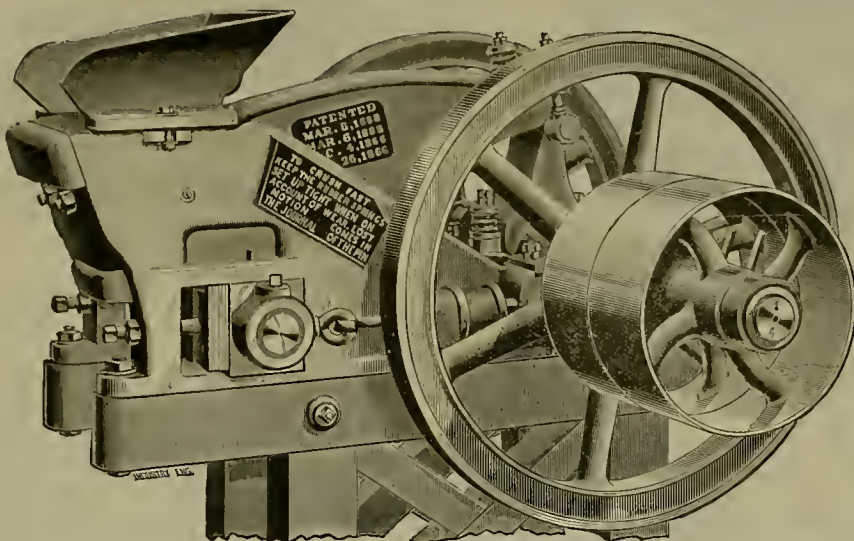
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Notice—There are delinquent upon the following de-
scribed stock, on account of Assessment (No. 24) levied
on the Ninth (9th) day of June, 1891, the several amounts
set opposite the names of the respective shareholders, as
follows:

Names.	No.	Cert.	Shares.	Amt.
Barrows, A. W., Trustee.....	553	500		\$15 00
" " ".....	555	271		8 13
" " ".....	562	500		15 00
" " ".....	563	500		15 00
" " ".....	568	1,000		30 00
" " ".....	569	1,000		30 00
" " ".....	578	500		15 00
" " ".....	597	1,000		30 00
" " ".....	598	500		15 00
" " ".....	599	500		15 00
Boehrer & Co., J.....	551	40		1 20
Bogart, O. H., Trustee.....	424	100		3 00
" " ".....	441	600		18 00
" " ".....	442	500		15 00
" " ".....	443	20		0 60
" " ".....	438	105		3 15
Nash, H. W.....	269	104		3 12
Stout, C. S., Trustee.....	476	2,000		60 00
" " ".....	477	953		28 50
Stout, Mrs M. E.....	170	500		15 00
" " ".....	188	500		15 00
Searles, W. A., Trustee.....	518	1,000		30 00
Wetzel, Theo., Trustee.....	301	50		1 50

And in accordance with law, and an order of the Board
of Directors, made on the Ninth (9th) day of June, 1891, so
many shares of each parcel of such stock as may be
necessary, will be sold at public auction, at the office of
the Company, Room 11, No. 303 California street, San
Francisco, California, on TUESDAY, the Fourth (4th)
day of August, 1891, at the hour of one o'clock P. M. of said
day, to pay said delinquent assessment thereon, together
with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California street, San Fran-
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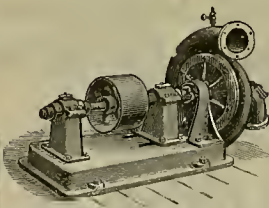
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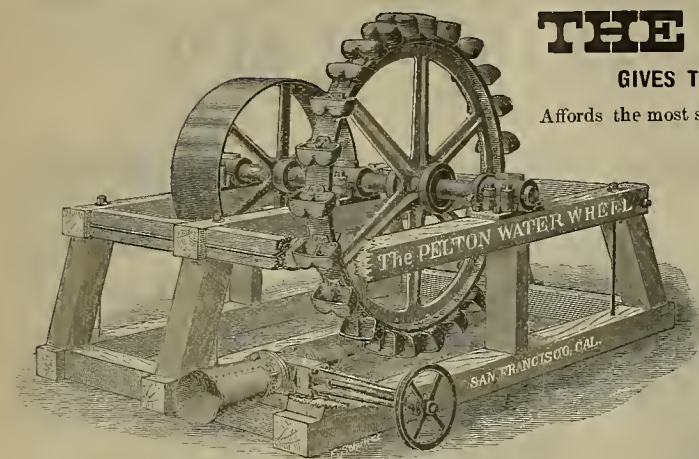
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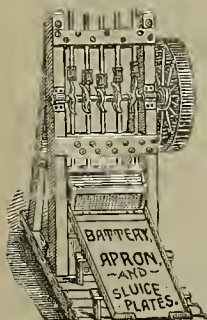
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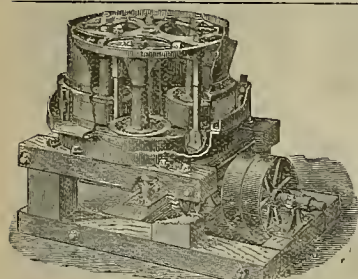
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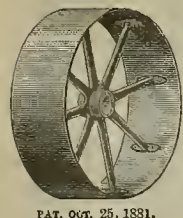
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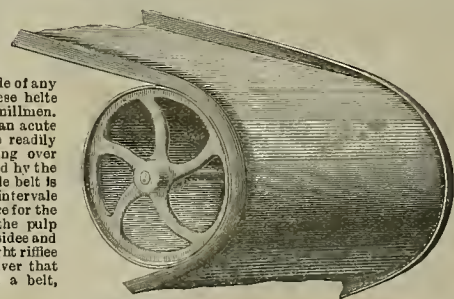
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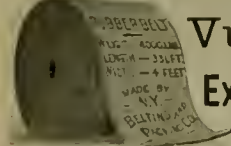
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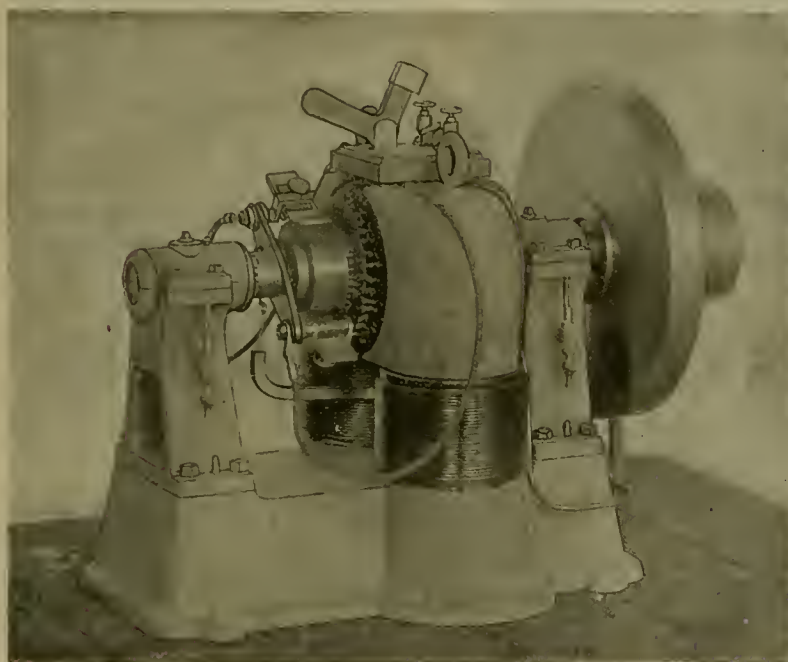


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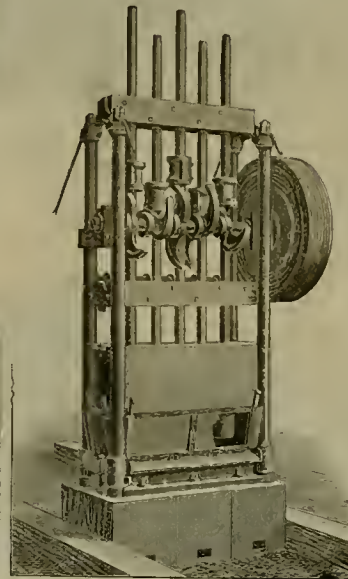
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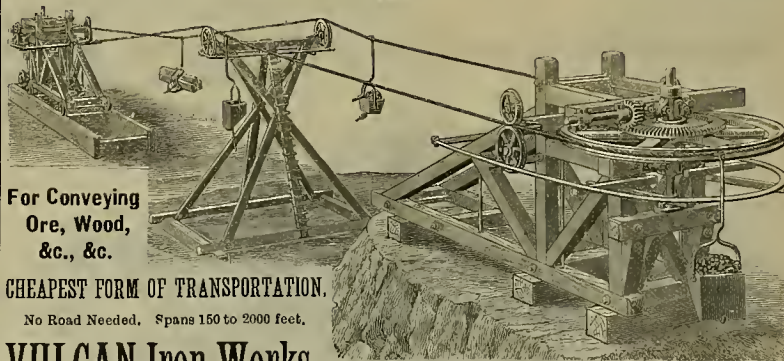
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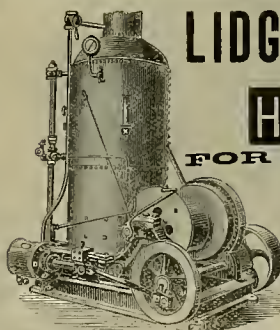
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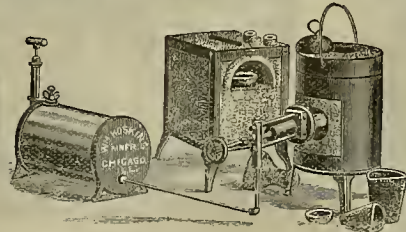
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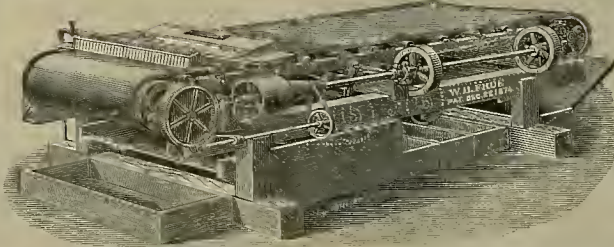
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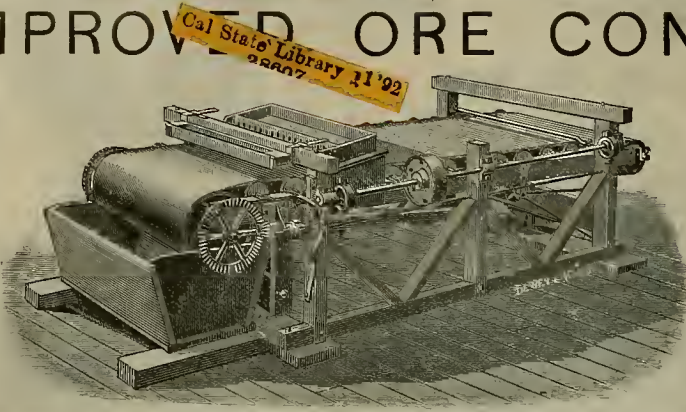
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Patented Oct. 8, 1889, and Dec., 1890.

ANGELS, CALAVERAS COUNTY, Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Good Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON CARREARD,
Supt. Good Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENT'S OFFICE, GIBSONVILLE IDAHO, Oct. 6, 1890.

MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running, and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.



ANGELS, CALAVERAS CO., Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours,
T. M. LANE, Supt. Madison Mine.

ANGELS CAMP, July 25, 1891.
MR. JAMES TULLOCK—Dear Sir: We are working sulphurets from mines in Calaveras and Tuolumne Co's. We find the sulphurets saved on your machines cleaner than those saved on any other. Yours truly,
THOS. N. SMITH, Supt. Utica Chlorination Works.

Price, \$450.

For further particulars, address JAMES TULLOCK, Angels, Cal., or

Risdon Iron and Locomotive Works,
Cor. Beale and Howard Sts., San Francisco.

WM. H. TAYLOR, President.

R. S. MOORE, Superintendent.

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S. E. CORNER HOWARD AND BEALE STS., SAN FRANCISCO.

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One (1) Complete Assay Outfit.

One (1) Complete Outfit for a 2½-ton capacity chlorination Works.

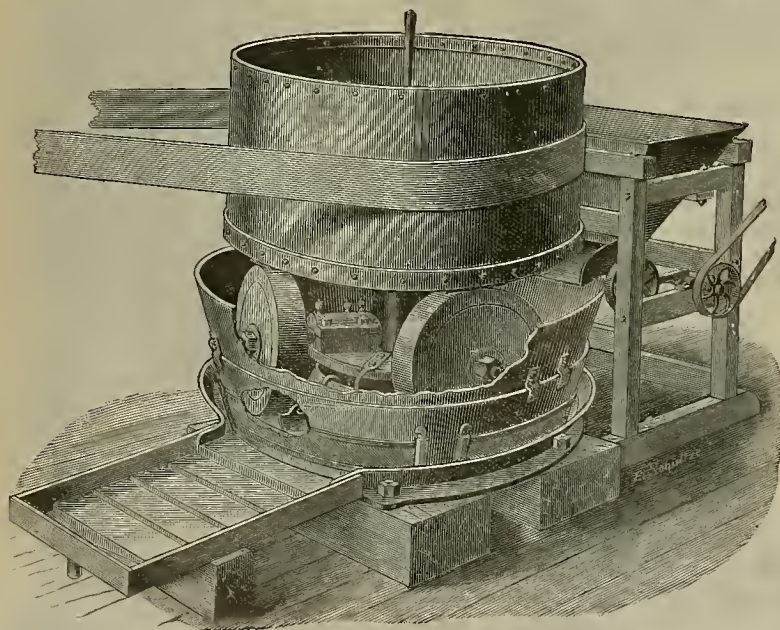
Two (2) 6000-gallon Circular Tanks.

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One (1) Batea.

Three (3) Frue Concentrators.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 8, 1891.

Three Dollars per Annum.
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Pulverizing Ore.

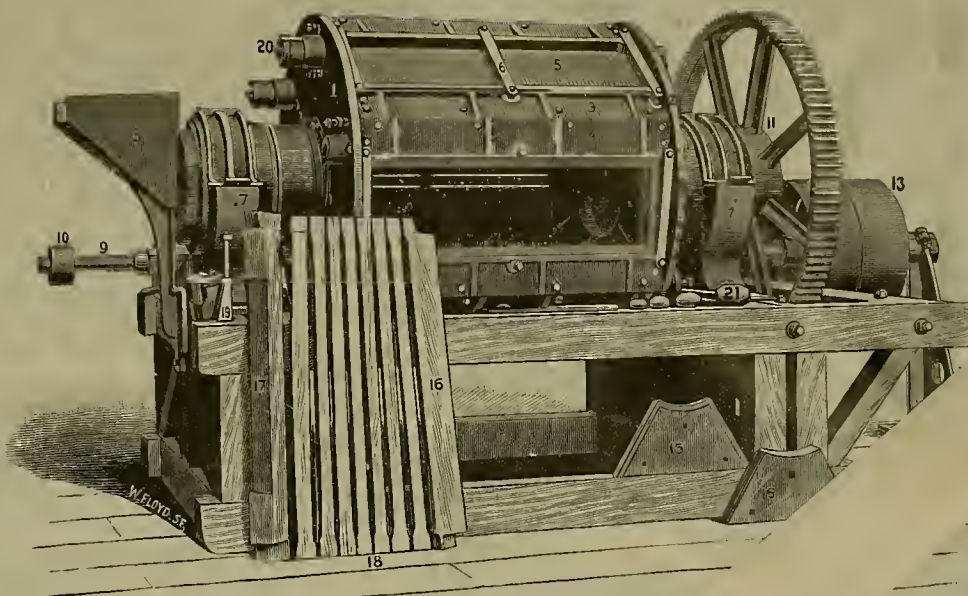
The Dodge pulverizer with all the latest improvements consists of a hexagonal drum or barrel, as shown in the cuts, into which the ore, after passing through the rock breaker, is fed by an ore feeder through the feed hopper. The barrel is lined with forged steel bars which are held in place by wedges, secured by bolts and rubber springs to prevent their working loose. These bars are so placed that there is a space of three-eighths inch between each and form a grating through which the ore passes to the screens, which are on each side of the hexagon and afford a ready means of discharge for any ore that is crushed fine enough to pass through them, while the coarser particles are returned to the interior of the barrel for further crushing.

The pulverizer being hexagonal in shape, the ore does not slide in mass, as is the case in cylindrical pulverizers, but is raised to a certain point and dropped by each side of the hexagon as the mill rotates, thus insuring more effective crushing and less wear on the bars. Pieces of hard quartz or stone are used for crushing. Steel grinders, weighing about ten pounds each, may be used for this purpose; or, preferably, both steel and quartz are employed.

The mill is arranged for either dry or wet crushing, and gives equal satisfaction under either arrangement. When arranged as a dry crushing mill, the water pipes and apron shown in the cut are not furnished and the bottom frame is hoisted up, forming a bin into which the crushed ore is discharged and from which it can be removed by means of an elevator or other device. The jar, caused by the falling of the ore and steel grinders on the bars as the mill rotates, tends to clear the screens and prevents "choking," which very materially adds to the capacity of the mill.

On account of the immediate discharge of

the ore through the screen, as soon as it is crushed fine enough to pass the mesh used, the percentage of slimes is reduced to a minimum, and the loss in the tailings correspondingly decreased as compared with forms of mills in which the discharge is accomplished by a "swash." One of the engravings shows the mill arranged for wet-crushing, and the other is a sectional view showing the interior parts. Those who have used this mill speak highly of its efficiency. The Parke & Looy Co., 21 and 23 Fremont St., in this city, are the manufacturers.



SECTIONAL VIEW OF THE DODGE PULVERIZER.

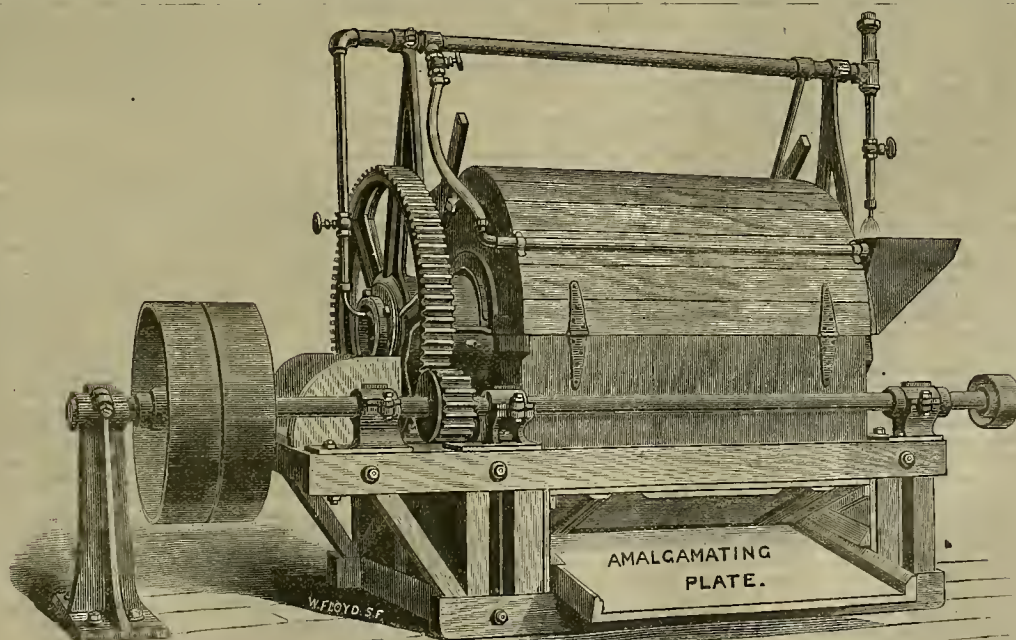
Quarrying Gold Ore.

The Treadwell mine, Douglas Island, Alaska, is worked differently from the ordinary gold-ore veins of this State. The vein is so wide that it is worked somewhat like a great quarry. The ore is of low grade, but there are immense quantities of it, so that the mine has paid very well. The men drill into the sides of the deposit, a blast is put in and large quantities of ore are dislodged.

The cut given herewith (for which we are indebted to the *Overland Monthly*) shows several

gangs of men at work drilling. The mine has the largest quartz-milling plant in the world. The mill has 240 stamps of 850 pounds each, 6 rock-breakers and 96 concentrators. It handles 600 tons of ore per day, using water-power or steam according to season. The mill was built by the Riedon Iron Works of this city.

THE Dugway excitement, urged so forcibly by the Salt Lake papers a few weeks ago, has dwindled to such a point that the line of stage running there from Stockton has been discontinued entirely.



DODGE PULVERIZER ARRANGED FOR WET CRUSHING.



THE TREADWELL MINE, ALASKA.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Tuolumne County Mines.

EDITORS PRESS:—During the past week I visited the mines of Tuolumne county that are situated in the vicinity of Columbia, Sonora and Soulsbyville.

The Old Tuolumne, R. C. Davis Supt., is best known as the Davis mine, and is situated about three miles northeast of Columbia on the south bank of the south fork of the Stanislaus river. At this time a tunnel is being driven which is now in over 600 feet, with from 200 to 400 feet more to go to cut the vein, which will here be tapped 300 feet deep. In the old workings the vein has been six feet in width of quartz averaging \$10 a ton with 2½ per cent of sulphurets. The mine has a five-stamp mill which will be moved down to the mouth of the present tunnel.

The Golden Era Mine.

A. F. Lucas Supt., was given a somewhat detailed description in a late number of the PRESS. In consequence, it is not necessary to state more than that the mill is running nicely, the drifts being driven ahead and the mine quietly but steadily being developed. As the superintendent's motto is "First the mine, then the mill," the Golden Era will be made to reveal all that lies hidden within her walls before an extensive and expensive plant will be erected. Every condition is favorable; all that is wanted is time for development.

The Keltz

Is being developed by the Leachman Prospecting and Developing Co. The results have been very satisfactory and have more than verified the report made by the writer on a previous trip. Your readers may remember that the property is on the south fork of the Stanislaus river, above the Golden Era and opposite the Riverside.

The Riverside

Is almost opposite the Keltz. The mill is at the river's edge. At this time the property is being worked by tributaries.

Above these mines on Rose creek are a number of mines which, on account of their almost inaccessible position, are but little known. Among these is the Last Chance, L. C. Tibbitts Supt. This mine is being developed by the Eagle Mining Co. The property is situated on Rose creek, between the north and south forks of the Stanislaus river. The company formerly operated the Eagle mine in the same vicinity, but have closed it down, and when the Last Chance is sufficiently developed will move the mill on to it. The vein thus far shows from one to three feet of quartz that runs from \$5 to \$8 a ton.

The Starr Mine.

This property is in the same section as the Last Chance. In the earlier history of the mine, large sums of money were taken from the spurs or feeders. The main vein is practically untouched. For years past the mine has received but little more than assessment work. Now, however, Mr. R. Lee McPherson has taken hold, and under lease will endeavor to develop the property. There is every reason to believe that in depth the numerous rich feeders that run to and into the main vein will make it rich and the mine a very valuable property. Mr. R. Lee McPherson has lately uncovered an old river channel on the Wine Spring ranch, near Columbia. This channel is between and below the old Texe and Nigger Gulch diggings. It was lost by the early miners and remained hidden until Mr. McPherson discovered it.

The channel is about 80 feet wide, with an average of four feet of gravel, which is covered by about 20 feet of soil. Thus far the mine has averaged \$25 a day, working two men. A pipe has now been put on, and better results will be obtained. The mine has an abundance of free water and several thousand feet fall for dump. In consequence, Mr. McPherson has every reason to know that he has "struck a good thing."

The Bellevue.

J. W. C. Maxwell is resident owner of this mine. It was formerly known as "the Hyde." The mine is opened by incline shaft to a depth of 350 feet, with drifts run 225 feet. The vein in the present workings averages 16 feet in width of milling rock. The returns have proved very satisfactory to the owners. The mill is of ten stamps, steam power, and is perhaps the best ten-stamp mill in the State. It was formerly on the Josephine mine, and is not alone complete, but the entire machinery is of the very best.

Soulsbyville.

This old and justly famous camp is quiet at this time, but there is every reason to believe that she will soon return to her old time prosperity. The old Soulsby has yielded an immense amount of the yellow metal in the past, and as only a very small fraction of her territory has ever been explored, there is every reason to believe that she holds a still greater store of wealth for those that will but develop the virgin ground. At the Platt & Gilson, the superintendent, Mr. Trittebach, is keeping up the developing of the mine and at this time is sinking.

The Black Oak is dropping 10 stamps on ore that is said to be high in grade.

Sonora.

At the Golden Gate, E. C. Loftus, the superintendent, has the shaft down 270 feet, and intends continuing down an additional 200 feet. When this is done and the drifts run, additional stamps will be placed in the mill, but the reserves will be created first, though the mine has sufficient ore in sight at this time to keep the present mill running for two years. Since my last visit additional water for power has been brought in, and a pressure of 300 feet obtained. Air compressors, power drills and a new hoist have been put in. Mr. Loftus is getting the mine into the best shape possible and the most satisfactory part of it, is the fact that the mine is paying for all the improvements. Through Mr. Loftus the mine has been made the leading property of the county, and in consequence of the money expended by the company, the people of the county should show their appreciation by kindly encouragement, that they may not only be induced to continue, but that other capitalists may also invest. There is no reason why the same encouragement should not be extended to mining that is bestowed on all other business enterprises. Almost any town will give a free site, a right of way, subscribe for stock, guarantee a liberal house and exempt from taxation any manufactory that will locate in their midst. Did anyone ever hear of any mining companies being given these inducements? On the contrary, every one that can, "goes for" a mining company in all sections alike.

The hydraulic miners have the apathy, if not secret hostility of the people in their own communities to thank for their defeat. But, "to return to our mutton." Outside of the Golden Gate, there is but little doing at this time. The San Giuseppe is closed pending litigation. The mine is so good that the old owners propose to contest their right to it, and in the meanwhile the purchasers and superintendent, Mr. W. G. Whorf must wait.

The Bonanza.

D. K. Oliver, the superintendent, says they are "not in it." In the Bonanza the gold is in pockets, which when the hove get "in it" turns out the yellow stuff by the hundred thousand. At present Mr. Oliver is taking down some old backs in the Bonanza and sinking from the end of the tunnel, on the extension, (The Last Chance).

The boys have done more than well on their lease; have all grown rich in fact, but the writer wishes them and all the mines of "Old Tuolumne" the best of luck in return for their uniform kindness and courtesy to

E. H. SCHAEFFLE.

MINERAL WEALTH OF THE SALTON SEA.—The Yuma Times believes thoroughly in the assertions of valuable mineral discoveries to be made through the exploration of the overflowed desert, now in progress, and says: A large part of the southern portion of the Colorado desert is still a country of mystery, and the Salton lake will result in one good thing at least, and that is, the mystery will be unveiled and explained away. The mud and lava volcanoes, hot and cold springs, bottomless pits and yawning chasms, the hundreds of acres of quicksands and volcanic ashes, which are known to exist, will most likely prove of but trifling importance by comparison with the discoveries which are likely to be made. During the year 1879, Cocopah Indians brought into Lerdo to George E. Batman specimens of rich cinnabar rock, and also some of the ore in the form of a powder, which they said existed in the country adjacent to the sulphur mine. An effort was made to find the place, but it proved unsuccessful, nor has it been discovered yet. The Indians, with all the superstition of their race, refused to act as guides, and in an off-hand way directed where the mine or deposit lay. Large nuggets of gold have been brought by Indians at intervals from the desert region, but the placers have never been found. Even if the parties now out should prove unsuccessful in their efforts, others will be organized; the history of both the woe and wealth of California's Colorado desert will be published to the world, and with the data properly arranged, will make very interesting and instructive reading.

SPENCEVILLE PAINT.—The enlarged mineral paint works being put up at the Spenceville copper mine, by Messrs. Peitzsch & Woehler, will be of sufficient capacity to supply the demand for the whole Pacific Coast, and the paint itself, as shown by analysis, is superior to any that has been placed on the market. By a chemical process, there are two shades of color given to the paint—one bright red and the other red-brown—which fit it for very general use, and of great utility in adding to the lasting quality of the wooden structures upon which it is used. The company has apparently an inexhaustible supply of the copper ore from which this mineral paint is made.—*Grass Valley Union*.

SEAMLESS GOLD TUBING.—A new process has been invented for the production of seamless gold-plated tubes. A longitudinally split tube of gold stock is first made, and, after covering it with a fluxing material, the gold tube is slipped upon the base-metal tube. The opening of the tubes must not be coincident with each other. The compound tube is now subjected to heat sufficient to fuse the gold upon the base metal, and at the same time to cause the melted gold to flow into the openings of the tubes, after which the compound tube is drawn through a draw-plate.

An Increasing Demand for Graphite.

The successful experiments which have been made in the use of graphite as a lining for converting vessels, it being a material specially adapted to withstand the outting action of the acid slag, has brought about a scarcity in the supply of old crucibles, and bids fair to open a new market for hurned graphite. But little over a year ago, says the *American Manufacturer*, old crucibles could be had, say, at a dollar per ton, their main use being as filling, or for a carload of cinders, one could obtain a carload of this, then waste material. One concern in Pittsburgh, last year, had the contract for all the waste crucibles from three of the leading crucible steel works in the city for \$1 per ton. But with the adoption of this material for furnace and converter linings, and the consequent increased demand for it, the price advanced to \$3 per ton, and has since gone even to \$10 per ton, and is hardly to be had in any quantity at that. It would seem that with the present and increasing demand for this material, and the source of present supply, which cannot be expected to increase sufficiently to keep pace with it, that calcined graphite suitable for the uses named must soon be put on the market. The supply of raw material is abundant enough, but it is the calcined, pulverized form that steel-makers want.

In this connection the following concerning the source of supply for the world and its cost may be of interest. The present supply for use in making crucibles for steel-making, comes from the island of Ceylon, in the south of Asia. Elaborate experiments have been made with the plumbago mined in the United States, in the hope of making crucibles for this purpose therefrom, but so far, with but indifferent success, or, at the most, with less success than with the imported article. Further, on account of the cheapness of labor in Ceylon, the work of mining and assorting being done almost entirely by women and children, whose wages do not exceed four cents per day, the imported article is cheaper than the home product.

Within the last year the price of plumbago delivered in New York has advanced nearly 60 per cent, due primarily to two causes—the quantity mined has fallen off, and the demand, especially outside the United States, has increased. The total amount of plumbago exported from Ceylon for the year ending June 1, 1890, was 161,874 cwt. For the year ending June 1, 1891, it was 148,043 cwt., a falling off of over 8 per cent. At one time three-fourths of the entire product of the island came to the United States, but at present this country does not receive one-half, and the proportion that it does receive is on the decrease. In the year ending June 1, 1890, 68,726 cwt., of Ceylon graphite came to America, and in the year ending June 1, 1891, only 35,936 cwt.

Germany is becoming a large factor in the trade in the matter of consumption, its increased use by the Krupp works being responsible for this. The imports of Germany for the year ending June 1, 1889, amounted to only 3094 cwt. In 1890 it was 14,215 cwt., and in 1891 about 11,000. The falling off noted from 1890 to 1891 was about proportionate to that in the output, and not due to any lack of demand on the part of that country. During the fiscal years of 1890 and 1891 the imports of graphite in England amounted to 61,949 cwt., and 57,906 cwt., respectively.

The price of plumbago varies according to its quality. It is divided into four grades, viz., large lump, ordinary lump, chip and dust. The present ruling figures are as follows: Lump (ordinary), \$4.50 to \$5 per cwt.; chip, \$3.60 to \$4; dust, \$2.80 to \$3.50. There is a very great scarcity of good plumbago in the market to-day, and no cargoes of any consequence are expected in this country before September 1st.

The quality of plumbago depends as much upon its physical structure as upon its chemical analysis. There is a deposit of this mineral near Reading, Pa., which in analysis is practically identical with the best Ceylon article, yet the best efforts of crucible makers have failed to produce crucibles therefrom equal to those of the Ceylon graphite.

From the foregoing it would appear that if graphite is to be used to any extent for furnace linings some form of it which can be had cheaper than old crucibles, or even the material mixed with clay, calcined and pulverized, is desirable. With the raw material selling, say, at 3 cents per pound, the cost of material of this sort is not likely to be much less than that of new crucibles, for the material would require the same treatment, less the molding into the form of crucibles, which would bring it, say, to 4 cents per pound, or \$50 per ton.

NETADA IRON ORE.—Thirteen miles from the line of the railroad in this county there is a mountain of iron ore containing 98 per cent of pure iron. It can be run into pig iron in any ordinary furnace. Some of it has been smelted at the railroad shops at Sacramento, where it is pronounced to be of the best quality of iron. Without exaggeration, the quantity is so great that the assessment work necessary to hold the number of claims that might be located on this body of ore, under the Congressional mining law, would furnish enough iron, run into railroad T-iron, to construct half a dozen double-track railroads from San Francisco to New York. This ore will pay to ship to any distance that the

pig iron will bear transportation. If the S. P. Co. would build a railroad 13 miles to connect with the main line and put on sufficient cars, it can furnish all the iron furnaces in the United States, with all the iron they can consume at the mere cost of transportation, and 25 cents per ton to mine and load it on the cars. The gold in the ore will pay all expenses of mining and transportation across the continent if it be desirable to extract the gold. The above is no fancy sketch, but potent facts to any one who will investigate the matter.—*Winnemucca Silver State*.

Will Erect a Smelter.

The American Mining Company, owners of several of the most prominent mines at the Seven Devils, of which company Messrs. Kleinschmidt, Houser and other capitalists of Montana are stockholders, are making preparations for the erection of a large smelting plant at Helena, the new town of the Seven Devils, the works to be in operation early the coming fall.

The present visit of Mr. John C. Rogers, superintendent of the company to Butte, is for the purpose of perfecting all plans, and he will then go East to purchase the necessary machinery. It is expected that the machinery for the smelting plant will arrive in Baker City in the near future for transportation to the mines by team via the Baker City Seven Devils road.

Mr. Mose Fuohs of this city has received advices that from 15 to 20 teams have been engaged by the American Mining Company to transport this machinery.

There is now no further speculation regarding the best and most direct route to the mines. The controversy is settled. Baker City, by her energy and business foresight, has laid all other competing points in the shade, and to-day has no rival for the trade of Idaho's great copper regions. All the Idaho towns realize this fact, and have nothing further to say. Baker City has distanced all rivals, and can justly claim the only direct and accessible route to the mines, and in the no very distant future will reap the benefit of her enterprise.—*Bedrock (Oregon) Democrat*.

THE GEOLOGICAL SURVEY.—The *Tidings* made note, a few weeks ago, of the presence of a corps of surveyors of the United States Geological Survey in this city. The first party confined its work to triangulation and elevation, establishing a base line on Alta Hill. A second corps is now at work platting, under the direction of Mr. Douglass of the Survey. Shortly, a third corps will arrive to pay especial attention to the mining claims of the district, and lastly a corps under the direction of Mr. Becker, an eminent geologist, will arrive to ascertain purely geological data. A survey such as this was made of the Comstock some years ago under the direction of Mr. Becker, and has proved to be of great value. We learn, however, that the survey outlined to be made here covers an area of only from 1½ to 2 miles square, excluding the rich Randolph Flat and Deadman's Flat mineral belts, both gravel and quartz. If possible, this oversight, if such it may be, should be rectified, as the belts indicated comprise a portion of the Grass Valley mining district, and some of the claims therein are yielding profitably and are full of promise. It is apparent that, with the engineers in the field, the additional expense will be trifling, and it is likewise obvious that a complete and correct survey will be of more value to the district and the Government than a partial survey. It is to be hoped that this matter will be brought to the attention of the management at headquarters and orders be issued authorizing the extension of the lines and the taking in of the mineral belts designated. County Surveyor Uren has much data that will be found of value by the gentlemen making the survey.—*Grass Valley Tidings*.

A PREHISTORIC TUSK.—At the Starling hydraulic mine in Jackson county, a tusk of mastodon was washed out a few days since from under a depth of 50 feet of gravel. The tusk was four inches in diameter and was porous and crumbling. Other bones of the same prehistoric animal have been found in this mine at different depths. Just how 50 feet of gold-bearing gravel came to be deposited atop of this tusk is a question for the geologist to decide. It may be that the gravel was washed there by some prehistoric hydraulic miner, who took out all the big nuggets of gold and left only the fine scales for this day and generation. The mammoth did not become extinct so long ago as some other animals, for carcasses of a number of the huge beasts have been found in a frozen condition in Siberia, in a very perfect state of preservation, and their bones have been found in Missouri in the same stratum with human bones, and one great hunter and still greater liar has given out that he has seen living specimens of the animal in the wilds of the Olympic range.—*Portland Oregonian*.

A CLOUDBURST in the Toiyahs mountains, above Austin, Nev., did considerable damage to the old mining town, as the water poured through the streets in torrents.

To prevent the evaporation of water in fire-pails, it has been suggested that 15 to 20 drops of oil will form a coating sufficient to obviate the difficulty.

The Precipitation of Metals from Hyposulphite Solutions.

(Continued from last issue.)

[Read by C. A. STRETSKY, of San Francisco, before the American Institute of Mining Engineers.]

3. Economy of Producing Hyposulphites by Oxidation of Sulphide Solutions.

The question is of importance, whether it is cheaper to buy and add sodium hyposulphite to a deteriorated stock solution, or to introduce hyposulphite by allowing the sulphide solution to oxidize, whereby it degenerates in precipitating power, but gains in hyposulphite. This depends upon local prices of chemicals. In most cases it will be cheaper to produce the hyposulphite by oxidation of the sulphide. A calculation under assumed conditions will be of interest. For $\text{Na}_2\text{S}_2\text{O}_3$, we find:

The formation of 100 pounds $\text{Na}_2\text{S}_2\text{O}_3 + 5 \text{ aq.}$ requires:

35.8 lbs. caustic soda of 90% at 5.5 ct. \$1.96
27.2 lbs. sulphur of 95% at 3.5 ct. 0.95

Total cost. \$2.91
100 lbs. $\text{Na}_2\text{S}_2\text{O}_3 + 5 \text{ aq.}$ at 4 ct. 4.00

Leaving a saving of. \$1.09

If this salt is obtained by the oxidation of Na_2S_2 in the mill.

The cost of obtaining calcium hyposulphite from the sulphide solution by oxidation cannot be accurately or even approximately calculated, for reasons already stated. From the fact that CaS_2 must be oxidized in place of Na_2S_2 , and that in the preparation of calcium sulphide relatively more chemicals are consumed, it follows that the cost cannot, in most cases, be materially less, although caustic lime is very much cheaper than caustic soda; and it may be even greater.

To use a calcium sulphide solution so highly oxidized that the stock solution increases in strength and volume, making it necessary to run it to waste, cannot be good economy, because it necessitates an excessive consumption of the precipitant.

Should it be desirable to use an oxidized sodium sulphide solution, containing a large amount of hyposulphite, oxidation is most conveniently and quickly effected by forcing air through a coil of gas pipe, provided with a great number of small holes, and placed at the bottom of the storage tank.

4. Precipitation of Calcium by Sodium Sulphide Solutions.

This subject has never been considered or presented before. I have observed in former paragraphs:

1st. That it is difficult to prepare the lower sodium polysulphides absolutely free from caustic soda.

2d. That if a sodium sulphide solution containing Na_2S is exposed to the atmosphere, $\text{Na}_2\text{S}_2\text{O}_3 + 2\text{NaOH}$ are formed.

3d. That free caustic soda absorbs carbonic acid from the atmosphere and becomes Na_2CO_3 .

In these reactions lies the key to the appearance of the mysterious yellow precipitate which Russell took for CaS . As can readily be seen, if Russell's sulphide is for any length of time exposed to the atmosphere, it must contain more or less Na_2CO_3 . The Na_2CO_3 originally contained in commercial caustic soda—which may vary between three and five per cent—also comes into play. Assuming, for instance, that six pounds caustic soda were consumed (manufactured into sodium sulphide) per ton of ore, containing four per cent Na_2CO_3 , there would come into action 0.24 pounds Na_2CO_3 , precipitating 0.09 pounds $\text{Ca} = 0.22$ pounds CaCO_3 . Assuming that Russell's sulphide had been made of a high-grade caustic soda (with 95 per cent NaOH), having the composition $\text{Na}_2\text{S} + \text{Na}_2\text{S}_2$, and that by long exposure to the air, one-half of the Na_2S became oxidized, but how much Na_2CO_3 would a quantity of Russell's sulphide contain produced from six pounds caustic soda? Exactly 1.28 pounds, precipitating 0.48 pounds $\text{Ca} = 1.20$ pounds CaCO_3 . Adding the sodium carbonate originally present in the caustic soda, the total amount would be 1.52 pounds, precipitating 0.57 pounds $\text{Ca} = 1.42$ pounds CaCO_3 .

A sodium sulphide solution containing Na_2S , if allowed to oxidize, is unprofitable for another reason. Equation No. 2 shows that only one-half of the Na_2S is converted into $\text{Na}_2\text{S}_2\text{O}_3$, the other half becoming NaOH . Thus oxidation of the solution is unsatisfactory in two ways.

If Russell's sulphide is to be used to advantage, it should be preserved in hermetically sealed tanks.

It has been shown in § 3 that sodium hyposulphite is obtained in most cases at less expense by allowing the sodium sulphide solution

*I have received from the Marsac mill some data concerning silver precipitated from wash-water and weak solution, and from the regular lixiviation solution; also, the values of these precipitates in silver and their percentages of lead and copper. According to these figures, the consumption per ton of ore of caustic soda in the manufacture of Russell's sulphide should be much less than it actually is, unless it be assumed that more than one-half the Na_2S in Russell's sulphide is oxidized by contact with air, a supposition with which the figures agree remarkably well. I do not give the details of this calculation, because I do not know whether the values on which it is based represent true averages.

to oxidize then by baying the hypo-salt; hence, it seems timely to abolish Russell's sulphide altogether and substitute in its place Na_2S_2 , or even a higher polysulphide, if Na_2S_2 cannot be obtained free from Na_2S .

All the statements made above are supported by actual experiments. I prepared from chemically pure reagents two sodium sulphide solutions, one with sufficient sulphur to contain $\text{Na}_2\text{S} + \text{Na}_2\text{S}_2$, another to contain Na_2S_2 . As I am fully aware, it is very difficult to prepare such solutions on a very small laboratory scale, free from caustic soda or from higher polysulphides; but this does not influence in the least the principal points at issue.

The following tests were made with the freshly prepared sulphide solutions:

1st. Solutions of calcium chloride and of gypsum in sodium hyposulphite were prepared, of such concentration that caustic soda produced in them a precipitate of calcium hydrate.

To these solutions the sodium sulphides were now added. Each drop of the concentrated reagents produced a slight flocculent precipitate of intensely yellow color, which would disappear again upon stirring. After successive additions of the reagents, the precipitates finally remained, but to effect this much more of the solution containing $\text{Na}_2\text{S} + \text{Na}_2\text{S}_2$ was consumed than of that containing Na_2S_2 . It became at once apparent that only a very small portion of the reagents was engaged in the reaction, the solution assuming an intensely yellow color. Upon adding a sufficient quantity of water the precipitates dissolve again; hence it was not possible to examine them further by filtering and washing with water. This was done, however, with alcohol, in which sodium polysulphides are soluble and calcium hydrate is not. After repeated washing with alcohol, the precipitates became white and proved to be calcium hydrate.

Now 50 c. c. of each sulphide solution was put into a seven-pound acid bottle and shaken for three hours, air and carbonic acid being blown from the lungs into the bottles every few minutes. In the beginning, the solution remained perfectly clear; finally a small amount of sulphur separated, indicating the presence of higher polysulphides than Na_2S_2 .

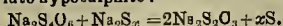
The oxidized sulphides were now tested with calcium solutions as before. Yellow precipitates appeared at once; but, with equal quantities of the reagents, the precipitate from the Na_2S_2 solution was quite small compared with that obtained by the $\text{Na}_2\text{S} + \text{Na}_2\text{S}_2$ solution. These precipitates were not flocculent, settled quickly and did not dissolve upon addition of water. After washing they became perfectly white, and proved to be CaCO_3 . Q. E. D.

It is claimed that the precipitate of calcium can be avoided if precipitation of silver, copper and lead is not done too closely. I am of an entirely different opinion. If the precipitate were actually an insoluble calcium sulphide, yes; but since it is CaCO_3 , its precipitation must commence at once. The precipitate becomes apparent only after the metals have been completely precipitated and if calcium still remains in solution. The precipitate appears yellow, because it holds mechanically sodium sulphide. Only prolonged washing makes it white. As will be seen from the example quoted previously, much more calcium may be in a lixiviation solution per ton of ore than can be precipitated even by a well-oxidized Russell's sulphide prepared from six pounds of caustic soda.

It remains to be seen how much sulphur is actually needed in practice to prepare a sodium sulphide free from Na_2S . How to test such a solution for ascertaining this has been shown above.

5. Regeneration of Sodium Hyposulphite from Tetrathionate.

In preparing Russell's extra solution, one pound of sodium hyposulphite is changed to tetrathionate for each pound of copper sulphate consumed. The formation of tetrathionate is further increased by the atmospheric decomposition of extra solution, so that, finally, the solution must hold a considerable amount of sodium tetrathionate, which salt is not a solvent for silver compounds. Fortunately, a very simple reaction converts the tetrathionate again into hyposulphite:



This reaction takes place in precipitating the solution.

So long as metals remain unprecipitated, it is doubtful whether this regeneration can take place or not. Close precipitation and over-precipitation, however, would give the reaction free scope; hence it will be judicious to precipitate closely, and to over-precipitate occasionally, the solution in a number of precipitating tanks. The excess of sodium sulphide is then neutralized by running some fresh silver solution into the precipitating tank. That all this is not merely theoretical speculation is proved by statistics from the Yedras mill, Mexico. With a consumption of 9.6 pounds copper sulphate per ton of ore for making extra solution, the loss in solution hyposulphite, by close precipitation, was only 1.4 pounds per ton of ore treated. When the consumption of copper sulphate was reduced to 7.7 pounds, the loss in hyposulphite fell to 0.74 pounds. In this case over-precipitation was not practiced; if it had been done, the loss in hyposulphite would have been reduced still further. That it is profitable to regenerate hyposulphite from tetrathionate the following calculation will show, based upon the quality and prices of chemicals assumed in § 3.

For the production of 100 pounds sodium

hyposulphite, a quantity of Na_2S_2 would be needed requiring:

21.5 pounds caustic soda \$1.18
16.3 pounds sulphur 0.57

Total cost. \$1.75
100 pounds $\text{Na}_2\text{S}_2\text{O}_3 + 5 \text{ aq.}$ \$4.00

Net saving. \$2.25

In this estimate the hyposulphite contained in and added by freshly prepared Na_2S_2 is included. In regenerating hyposulphite from tetrathionate, free sulphur is added to the precipitated sulphide, as follows:

For 100 parts hyposulphite regenerated, there are added:

When Na_2S_2 is used 6.45 parts of sulphur
" Na_2S_2 " 12.90 " "
" CaS_2 " 32.25 " "

In these figures the hyposulphite added by and contained in the sulphides is not included.

(To be Continued)

The American Flag.

An order has been issued by the War Department that on and after July 4th the National flag will consist of 44 stars arranged in six rows (as shown in the accompanying sketch)



on a blue ground. So if you are purchasing a new flag this year, says the Chicago Tribune, be sure the storekeeper does not unload upon you one very much out of date, which only represents a part of this good and rapidly growing Republic. Demand the latest and see that you get it.

Every star in the new flag represents a phase of progress in the Nation's history. On June 14, 1777—114 years ago—the American Congress passed a resolution that "the flag of the 13 United States be 13 stripes, alternate red and white; that the Union be 13 stars, white in a blue field, representing a new constellation." In 1795 two stripes were added to commemorate the entry of Vermont and Kentucky as States into the Union, and two new stars were also placed with those in the Union. The stars were then arranged in three parallel rows.

No further change was made until 1818, although in the meantime Tennessee (1796), Ohio (1802), Louisiana (1812), Indiana (1816) and Mississippi (1817) had been admitted. On April 4, 1818, a bill was signed by President Monroe reducing the number of stripes to 13 and adopting new stars for the States admitted since 1795.

The number of stars has been increased as follows on the Fourth of July of the following years:

In 1819, one star for Illinois; 1820, two stars, one for Alabama and one for Maine; 1822, one star for Missouri; 1836, one star for Arkansas; 1837, one star for Michigan; 1845, one star for Florida; 1846, one star for Texas; 1847, one star for Iowa; 1848, one star for Wisconsin; 1851, one star for California; 1858, one star for Minnesota; 1859, one star for Oregon; 1861, one star for Kansas; 1863, one star for West Virginia; 1865, one star for Nevada; 1877, one star for Nebraska; 1877, one star for Colorado; 1890, five stars for North Dakota, South Dakota, Montana, Washington and Idaho; 1891, one star for Wyoming, making 44 in all.

BED OF PIPE CLAY.—A. Larabee and Eddie Owens are at work prospecting an island in the river about two miles below Goodyear Bar. They are after a bed of gravel which underlies a body of pipe-clay. The early miners worked down to the clay, and thinking it was a kind of bedrock went no farther. An unworked portion of the river bed is supposed to underlie the pipe-clay. The question is, how came this large body of pipe-clay in the bed of the river? Where did it come from? Did it come from some plover channel which crossed the country at an altitude of 2000 feet above its present resting place? If so, what preserved it for the vast lapse of time which was required to erode the canyon of the Yuba to its present depth?—*Nevada Transcript.*

THE Calumet and Hecla mines, Michigan, will shortly have an electrical mining plant installed. The plant is expected to be a model one, and will do much to hasten the application of electricity in mining work elsewhere.

A PHILADELPHIA MAN has been blood-poisoned, probably fatally, by the bite of a mosquito.

New Well Boring Hydraulic Pump.

LANCASTER, LOS ANGELES Co., July 22.—The first artesian well ever sunk in this valley (Antelope) and probably in California, without casing or pipe of any description was successfully commenced and finished to-day by means of a hydraulic pump. This morning at 8 o'clock, three men started to sink an artesian well at Mr. B. Hanneh's ranch, some six miles west from this place, and by 6 o'clock they had struck a fine flow of water at a depth of 260 feet. The whole valley is enthusiastic over the occurrence, since heretofore to sink such a well would have taken two months at a cost of \$2,500 per foot, while under this system wells can be sunk at \$1 per foot. The parties putting down the well are from Alamosa, Colo., where they have sunk numerous wells under the same system. Failure was prophesied for them on every side throughout this section, but nothing daunted they went to work with the above result. They had been promised contracts for two or three dozen artesian wells should they be successful, and but little doubt now exists that that number will be added to the dozen or so already sunk here under the old system. Should their future efforts be as successful as that of to-day, the much-vexed question of irrigating this vast country will be practically solved.

LANCASTER, LOS ANGELES Co., July 23.—The new method of sinking artesian wells without casing by the hydraulic pump continues a success. This morning, one and a half miles west of here, a well was sunk 150 feet inside of five hours, and a flow of five miners' inches obtained. Letters of inquiry are pouring in from all parts of the State, and it is safe to predict that before the end of the year every quarter section for some six miles around will have its own flowing well and that Government land will be a thing of the past in this section, as it has been solely a lack of water that has kept the valley back, the land being admirably adapted for deciduous fruits and alfalfa.

DRY KILNS are beginning to come into more general use in this section. When local building was at its height lumber could be sold readily as it came from the saw. Now, however, competition is very strong and he who can sell the best lumber for the least money, generally captures the trade. The business of manufacturing lumber is undergoing a radical change. Dry kilns are being rapidly placed in all the old plants of importance, while they are considered as indispensable adjuncts to the new concerns. Modern machinery is being adopted. Manufacturers are discarding the methods employed of old and "catching on" to those of other lumber regions. The hand saw, which up to a very recent date was believed to be absolutely worthless for use on Washington fir, is being used with great success in a number of new mills on the Sound, and the quality of lumber so far as appearance is concerned, is far superior to the old obsolescent kilns which are employed altogether in one or two of the old fashioned mills in Tacoma and elsewhere. One concern in particular, which never can be induced to adopt any improved machinery, turns out lumber that most manufacturers of this section would be ashamed to put aboard of a vessel. And yet this company boasts a capacity of nearly half a million feet daily and ships large cargoes to California and foreign ports. It can hardly hope, however, to compete in any new market and even its old time prestige is slipping away from it since its competitors have begun to experiment on the timber of this region with modern machinery.—*Puget Sound Lumberman.*

COSMIC DUST.—The kryokonite collected by Nordenskjöld in Greenland in 1883 has been investigated by Wulff, and found to consist mainly of feldspar, quartz, mica and boron-blende. Garnet, zircon, magnetite, augite, sillimanite, together with a nitrogenous organic substance, are also present in it. The larger part of the dust is thought to be a sediment from the air, and to have been obtained by it from a region of crystalline schists. But the most interesting constituents of the dust, little oblongs of opaque, isotropic, transparent and double-refractive material, are considered to be of cosmic origin, owing to their similarity to the oblongs obtained in deep-sea soundings.

A FLEXIBLE SANDSTONE.—A greater curiosity than spongy sand is found in the flexible sandstone of North Carolina. The quarries are in the mountains of the southwestern corner of the State, and the stone is taken out more as a curiosity than for any other purpose, though it is sometimes employed in building. When cut in a thin piece, say the size and shape of a common whetstone, you can bend it into a considerable arc without its breaking, and it will resume its former straightness on the pressure being removed. Of course if you bend it too far it will break, but the fact that it will bend at all is most remarkable.—*St. Louis Globe Democrat.*

NEW ANESTHETIC.—Mr. Labord, a French scientist, has announced his discovery of a new anesthetic, which he calls crystallized nareol. It is said to be superior to other anesthetics, inasmuch as no digestive rearrangement follows the sound sleep into which it carries the patient.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

HARDENBURG.—*Ledger*, Aug. 1: The result of the work so far done on this property at Middle Bar is sufficiently encouraging to induce the company to prosecute explorations to a greater depth. The shaft is to be sunk 100 feet deeper at once. The mill will be kept running steadily, if possible, while this work is in progress. The outlook is deemed very favorable for the Hardenburg developing into a steady paying mine.

PLYMOUTH CBN. G. M. Co.—Mr. H. W. Lazelle, secretary of this company, has issued the following financial statement to July 1: Surplus Jan. 1, 1891, \$22,258.93; miscellaneous receipts, \$235.16; gold bullion produced, April—\$5812.68; May—\$3011.96; June, \$4395.91; total, \$37,739.64. Expenses, January—\$2313.68; February, \$2496.39; March, \$2605.76; April, \$3049.84; May, \$3016.22; June, \$3493.50; total, \$16,975.39. Surplus, \$20,764.25. He also says: "Since the last statement further progress in the upraise developed the existence of a valuable body of ore. It gradually widened to six feet, and is of good grade. When work was suspended, the upraise was nearly 200 feet high. With so favorable an outlook, the management felt justified in commencing a new tunnel in order to work the newly discovered rock advantageously. Operations elsewhere were suspended July 1, while a station is being cut out for new tunnel. The new tunnel now being run to ore will take a number of months to finish. Until that time we can run but few stamps, but after completion, the output should be largely increased."

MISCELLANEOUS.—The Amador gold mine remains idle, with no change to report in the situation. Indeed, the general opinion is that it will be tied up for some time yet. The furniture in the dwelling-house was attached recently for about \$500. The English company paid off the debt, which goes to show that they will eventually straighten out all the financial tangles in which the mine is involved. Large quantities of timbers are being delivered at the Kennedy and Zeile mines; about a dozen big teams are engaged in hauling from the mountains. The Kennedy swallows up something like 5000 round timbers per year, and the Zeile a still larger number.

MARBLE AT VOLCANO.—Since the opening of the now famous Carrara marble quarry, near Pine Grove, and the shipment therefrom of a large amount of marble to the San Francisco market, renewed activity has been stimulated in various other parts of the county in the way of prospecting for and developing other quarries; and it already begins to look as though "Little Amador" will soon be prepared to supply all the marble that will be needed in this State for the next century. We made a short visit to Volcano last Saturday, and during our brief stay in the town, we were shown a large number of specimens of fine grained marble of various colors which had just been taken from two new quarries that are being opened in that vicinity, and were kindly permitted to bring a few specimens home with us, which can be seen in our office at any time. One of these quarries is situated almost in the edge of town and is owned by O. Tam, John Rossi and others, and is a very extensive one. The other one is only a short distance from the town and is owned, or headed by Mr. V. Particelli, the well known stone cutter of Jackson. We are informed that both these are very extensive and consequently the supply will be practically unlimited. The only drawback now to the successful working of these quarries is the expense of transportation which we think will be cheapened when the proposed electric railroad shall have been completed, which we hope will be in the near future.

Calaveras.

WOODS.—*Cor. Calaveras Prospect*, Aug. 1: The Wood's mine, at Indian Creek, hounded and operated by Colin Campbell, of San Francisco, is developing into as good a mine as there is in the county if all reports are true. Under its able management new chutes of ore have been found and the mine opened in a systematic manner. The ore taken out averages as formerly when the mine was at its high and highly productive. It is said that there is an abundance of rock, and with the mine properly manipulated it will hold its own position with any. The mill at the Total Wreck, near this place, will be moved to Indian Creek in the near future.

El Dorado.

THE BALTIC DISTRICT.—*Mt. Democrat*, August 1: During the past week the Blue Gorge has been turning out very fine ore, which seems to improve as developments progress. At the Big Bonanza mine, at a depth of 50 feet the vein is 11 feet between walls, the ore being of high grade. At the Baltic mine preparations are being made for active operations. The mine is fairly well opened with shaft and levels. Additional buildings are being erected. The Scironi mine is showing well, with over 100 tons of ore on the dump.

IN THE GOLD HILL DISTRICT the old Barbara mine is attracting attention. In early days an incline shaft was sunk 60 feet deep the ore from which was hauled to Grass Valley for reduction and paid \$15 per ton, the ledge at that point being three feet thick. Several openings were made along the ledge showing it to be from 2½ to 12 feet in thickness. The ore giving fair prospects at every opening. At the Manzanita Queen mine in Diamond Springs district, the Superintendent advertises for bids for the sinking of a shaft 46 feet in the clear, 100 feet deep. Andrew O'Neil has struck good paying gravel in his tunnel at Weaver Hill. A force of men has been at work at the Fort Jim mine in Newtown district. The Dalmatia Co., of Kelsey district, have purchased the old St. Lawrence mine, and have commenced excavations, with a view to putting up works on that mine.

Humboldt.

COAL ON MAPLE CREEK.—*Blue Lake Advocate*: In regard to the coal mines on Maple creek, Mr. G. H. Close speaks nothing but the truth. The writer of this article lived some four years in that vicinity, and had lots of chances of looking at the coal mines; in fact, for over two winters, burnt nothing else but coal, coming around there. The

coal found on Maple creek is a good deal like the coal found along the range of mountains, back of the Yellowstone river, in Montana. Should these mines be opened, it would make Humboldt county, for the writer is of the same opinion, that once the mines are opened, they will be found exhaustless, and will make another shipping industry along with the Redwood. Besides there is a great quantity of oil which would be brought to market, but unless these mines are opened, and the railroad pushed to there, the mines may remain in the same conditions that they have been for the last 40 years that this county has been settled.

Mono.

BODIE CON.—*Miner*, July 31: During the past week east crosscut No. 1, 700-foot level, was extended 12 feet. East crosscut No. 2 from main north drift, same level, was extended 16 feet. East crosscut, 250-foot level, Jupiter shaft, was extended 10 feet. There were employed 10 miners and 1 carman, and jointly with Mono, 1 engineer, 1 blacksmith, 1 carman, 1 watchman, 1 hoiler-maker and 1 foreman.

THE MONO.—During the past week upraise from No. 2 south drift, 700-foot level, was extended 14 feet.

Nevada.

MANZANITA MINE.—*Grass Valley Union*, Aug. 1: The new incline of the Manzanita gravel mine, Nevada City, is down 160 feet. At the depth of 240 feet it is the intention to commence drifting for gravel channel.

THE EAGLE BIRD SOLD.—*Transcript*, Aug. 1: O. Newhouse is in town to-day on his way from the Eagle Bird (Diamond D) mine at Mayhew, Washington township, to S. F. He will not return to this county. Mr. Newhouse verifies the announcement made by the *Transcript* a few weeks ago, to the effect that the mine, which is one of the most valuable and extensive quartz properties in the State, has been sold to a S. F. Co. The mine has yielded about \$250,000 within the last 2½ years. During the preceding two years, when under the Shattuck regime, the output was \$200,000. The property has been turned over to the purchasers, and Henry C. Callahan, who was superintendent of it till last year, has been reinstated in that position.

CORTEZ.—*Silver State*, Aug. 1: Sam Jolin and Jack Houston came in from Cortez last week. Fourteen tons of \$300 ore have been shipped from their mine in Mill Canyon to Selby & Co.

THE MANZANITA.—*Transcript*, July 30: The incline at the Manzanita gravel mine is down 160 feet, and the bottom is in soft bedrock, through which progress is being made at the average rate of nine feet per 24 hours. Forty-eight feet was made last week. When a depth of 80 feet more has been attained, drifts will be started. The stockholders feel more than satisfied with the result of operations thus far.

DROMEDARY MINE.—*Grass Valley Union*, Aug. 2: It is in contemplation during the present season to effect an organization to reopen and work the Dromedary quartz mine, within the town limits on Wolf creek. It is very well remembered when this mine produced remarkably rich quartz, during the time that John T. Bradley was superintendent; but like all mines, it had its poor streaks, and subsequent to Bradley's management its owners failed to make it pay, and financial difficulties finally caused the mine to shut down. Years after the Dromedary shut down, rock from the old dump pile was hauled and broken up on Main street for macadamizing purposes, and quite a number of pieces were found to be rich in free gold.

CALIFORNIA.—The new hoisting and pumping works on the California are making good progress. The new plant is to take the place of the temporary one that was put up for prospecting purposes, the developments warranting the erection of heavier machinery. The new works will be ready to start up early in September, and in the meantime a five-stamp mill will be in process of erection, which will be ready to crush ore by the middle of October. These surface improvements will require an outlay of not less than \$8000. When the new hoisting works are completed, it is the intention to sink the main shaft 200 feet deeper with as little delay as possible, and two new levels will be opened. The mine in the north drift of the present lower level is looking well, the drift and stope carrying a well-defined vein of high-grade milling ore.

WYOMING CONS.—Some very handsome pieces of quartz from the Wyoming Cons. were brought to town on Friday, that were taken out within 16 feet of the surface. The quartz showed well in free gold and gold-bearing sulphurets, and was encouraging to the company as to what may be found when the vein is opened up so as to give backs to work upon. The new incline shaft is now down 60 feet, and it is contemplated when more depth is attained, to run crosscuts into two veins that are known to be in the location. The vein above spoken of is a strong one, and is a continuation of the Lawrey vein on Winchester Hill.

PEABODY.—A new level is being opened in the Peabody 75 feet below the No. 2 level, the drifts running both north and south from the shaft. The indications are good, and before long the pay shoot that was found above will be opened upon, which it is confidently expected will yield as well as it has heretofore. The pump is handling all the water easily.

GOLD FLAT.—The new hoisting-works building of the Gold Flat M. Co. on Gold Flat is up, and the timbers are being put in on which to place the machinery. It is expected that everything will be in readiness to start the underground work by the 1st of September.

Plumas.

JOHNSVILLE.—*Cor. Plumas County Bulletin*, July 1: Having obtained an elevation of 7000 feet, the town of Johnsville was reached. Its population of 500 souls is supported entirely by the mine. The fine 60-stamp mill, shops, office, boarding-houses, etc., belonging to the company are located here, all well built, neatly painted and presenting a thrifty and business-like appearance. The substantial and conservative methods employed in the management of the company's property are noticeable throughout. Eureka Peak, bare, castellated and abrupt, rises some 1500 feet from the bench on the west bank of Jamison creek, on which Johnsville is built. All over the face of this mountain, and extending nearly to its summit, the past and present workings of the great mine are to be seen. Some tunnels are marked by dumps of waste,

others by shops, timber sheds and covered tramways.

JAMISON.—Situated about a mile east of Eureka, and upon the opposite side of Jamison creek, is the property of the Jamison M. Co. Preparations are here in progress for extensive operations. Tunnels are being run and shafts sunk in the development of the property. Substantial buildings have been erected for office, boarding and store houses and other purposes. Arrangements are being made this season to put up machinery for hoisting and compressor purposes. Water is the motive power to be used and is brought in 22-inch pipe under 450 feet pressure. A fine ditch of a mile in length conveys the water from an inexhaustible source of supply. This consists of a chain of four lakes.

GOLDEN GATE.—*Plumas National*, Aug. 1: Wm. Monroe, once amalgamator at the Reno Reduction Works, arrived in town Friday morning. He will take charge of the Golden Gate mill, which will start up in a day or two. This is the name of the mine owned by Messrs. Barker, Sutton, Braden and others. Wade Hayes, a miner who worked on the Middle Fork in the early fifties, but who recently came from the lower country to search for a rich quartz vein, found it one day last week. It is about a mile below Old Nelson, and is reported to be rich. Schmidt & Co., of the Bonanza mine, are in with their tunnel 425 feet. For the past five or six weeks they have had very hard rock to contend with, but are now through it in good picking rock. They think that 75 feet more will let them into gravel. While at Johnsville, on Monday, we were shown a piece of gold by P. Lorenza that was picked up one day last week by "Commodore," a Greek, who is mining in Jamison creek, just below Johnsville. It was worth \$101. Mr. Lorenza had several other nice specimens that came from the different mines in that section. J. C. Knickrem showed us a nice specimen that came from the Ohio Point claim, situated at the head of Mohawk Valley, and owned by Knickrem & McKenzie. It was pure gold, and weighed \$80. This claim is about a half-mile below the famous Steelman & Hayes claim, from which a cleanup was made last year of \$45,000.

San Bernardino.

THE TIN MINE.—*Riverside Press*, Aug. 1: Col. E. N. Robinson informs us that a good many erroneous statements are being made by reporters and correspondents concerning the tin mine. They are not employing 250 men, but only 80 at present. They have not sent for a dozen English concentrators for they have the Frue, a better machine than anything made in England. They have no new-fangled five-stamp mill which does the work of 20 ordinary stamps, but are putting in an additional 10 stamps, which will crush 45 tons each day, besides the five tons crushed by the present experimental mill. They will then be able to get out 60 or 75 tons of metal (cassiterite) per month. All fabulous statements of daily output of tin are absurd. The furnace has not been burned out, and been replaced, as stated, but the brick bottom, which was of a poor quality, has been relaid with fire brick. They can profitably separate the tin from the ore, which goes 1½ per cent. The very rich ore such as goes 50 or 70 per cent (of which specimens are on exhibition) is not so easy to work as the lower grades. It holds so much metal that it sticks to the concentrator. Five or ten per cent ore is the best to work. All is prospering at the mine.

THE GABRIEL MINES LEASED.—*Riverside Enterprise*, July 24: The Gabriel gold mining district, comprising 4800 acres of the mineral and agricultural land of the San Jacinto Estate (Limited) with its valuable veins of gold and other minerals (excepting tin) passed yesterday into the hands of M. C. Westbrook, who, for himself and associates (Eastern capitalists) have acquired a ten years' lease of the property. The policy evidently, of the company who own the estate is to "farm let" as much as possible of their immense territory to small holdings, and confine their energies and capital exclusively to the development of their tin mines and the production of that metal. The lease given by the English company to Mr. Westbrook is for five years with the privilege of ten. Active work of development will be immediately commenced under the general management of the lessee with the able assistance of J. H. Crossman, that well known and veteran mining expert, as superintendent. Mr. W. proposes immediately leaving for San Francisco for the purpose of purchasing suitable machinery for the development of the property. Both the lessees and lessors are in Riverside to-day, for the purpose of ratifying the contract by legally signing the papers.

Shasta.

OLD DIGGINGS.—*Redding Free Press*, July 18: Since the bonding of the Mammoth mill prospects are brightening up in Churntown and Old Diggings mining district, and we are looking forward to a prosperous future. At present there is unusual activity going on in the various quartz lodes that intersect this district. The Calumet Mining Co. is working three men in the mine and about 15 men are employed at the mill. The ore which it is at present extracting is worth from \$80 to \$90 per ton. The next claim upon the lode is the Flannagan & Lynn. Considerable work has been done upon it, but at present writing one of the owners is wielding a sledge and drill at the Calumet, while the other is looking after his store in Churntown. If a little energy were infused into the working of this ledge (it being practically the same as that upon which the Calumet and the Utah Consolidated are located) there might be another mill or set of arrastras at work here. At the Utah Consolidated (Walker Bros.' mine) the regulation quantity of deadwork is being done. 'Tis a pity that this mine, with the fine plant which they have upon the river, has failed to give satisfaction to the owners by the working process tried in the past. Next in the line is the Bavaria, owned and worked by George Bear. The owner is hard at work driving the lower tunnel, hoping against hope that ere long he may uncover a bonanza. One shipment of ore from the upper workings netted him \$33 per ton over expenses, but there is very little of that kind of ore in sight. The Puritan, owned by Archie McKinnon, shows an occasional prospect from the surface croppings. As the owner has got nothing but muscle for capital, he cannot give the necessary attention to development. The Evening Star, owned by Frank Panter, has a tunnel driven upon the ledge for about 120 feet, showing one ledge of fair-grade ore, about 20 inches in width, and another parallel ledge, barren. Within the exterior boundaries of this claim there are five

or six small ledges which may possibly show up under further development. The Kit Carson and Spanish claims, formerly owned by Tom Harrison of Quartz Hill, but now in possession of Joshua Hendy of San Francisco, are idle at present writing. The only work done upon the Gertrude, owned by Mr. Anthony, has been a shaft about 25 feet in depth. At the Central, the Thompson boys are driving the new tunnel ahead, night and day. They expect to tap the ledge by September. If so, that means the starting up of the Central mill and the addition of another bullion-producer to the credit of Old Diggings. The new company which has taken hold of the Mammoth is making things lively, building roads and fixing things generally. They have leased the Walker mill and mean to have the quartz teams jogging over the grade thereto next week. The opening of this mine will add at least 70 men to the population here. The bond of the Mammoth includes the Bell and Garfield claims, thus giving the new company plenty of room for muscular exercise. The amount of work already done upon this property is quite extensive, the upper tunnel being 550 feet in length, the lower one 704 feet. There has been a large amount of ore extracted from the Mammoth proper, and there is plenty of ore in sight. The general average of shipments under the old control was \$250 per ton, and some of it went as high as \$3000. The character of ore is free gold and iron sulphurets. The Texas Consolidated keeps up its repute for both quantity and quality of ore produced. There must be gold bars in sight which require no effort to reduce, if we take into consideration the amount of improvements already made and those in contemplation—since last September a new ten-stamp mill and a full equipment of concentrators; also a new cable road for bringing the ore from the mine to the mill. Now comes an additional ten stamps and four new concentrators. Last, but not least, is the La Grippe, owned by Frank Young. This is the northeast extension of the Garfield. A tunnel about 120 feet in length has been run upon it. Frank expects to tap the ledge by driving. The croppings of the ledge, so far as prospected, show well in free gold.

CUSTOM MILL.—*Shasta Courier*, July 18: A steam driven custom quartz mill plant at this place would undoubtedly pay, as this is the centre of a country containing countless ledges, ore bodies, veins, pockets, and all sorts of formations that contain valuable minerals. A mill here would be furnished hundreds of tons of ore free for a starter to owners of ledges desirous of learning the value of their quartz by actual working process. Who will take advantage of the opening and put up a mill? There is money in it.

Sierra.

WIDE AWAKE.—*Mt. Messenger*, August 1: Freddy Bosch, superintendent of the Wide Awake mine, was down on Wednesday last, and says the mine is looking splendid. The gravel is paying and improves every foot they advance down the slope of the bedrock.

YOUNG AMERICA.—The following were elected officers at annual meeting of the Young America Co., G. M. Co. Directors: G. H. O. Sanderhaus, Watt Hughes, A. C. Bush, Thomas Brennan and J. H. Knuthson. Thomas Brennan was elected Pres., and J. H. Knuthson, Sec'y of the Company.

Slackuou

BLUE GRAVEL.—*Yreka Journal*, July 29: The Yreka Blue Gravel Mining Co.'s shaft is now down about 60 feet, and the indications of striking good pay seem to be gradually improving. Two more men have been added to the force this week to continue the work day and night, with greater rapidity. The ground cut through, contains a mixture of sandstone and blue gravel, a very good sign of an ancient channel where the hill now exists along the eastern side of Yreka. The river miners on the Klamath are rushing along the work of hoisting pay gravel, carrying on operations day and night. Only a few have yet reached the bedrock, but all will be down in a very short time to realize high pay. The quartz miners in Scott valley and at Indian creek, Humburg, Deadwood, Salmon river, and various other quartz mining districts are getting out quartz constantly, from which good returns are realized. Lee, Lash & Co., have reached bedrock in their new shaft near the stage-road, and find that blue gravel does not extend so far in that direction from their old shaft, or else takes a turn in a different course. They will sink another shaft nearer the first one, and then follow the course of the blue gravel channel, so as to keep directly on it. When they were obliged to quit work by a cave in their old drift, they had just reached the richest pay, and will probably open another shaft at that point.

Trinity.

NEARLY READY.—*Journal*, August 1: Mr. Arnold informs us that he has the Thanksgiving mine on East Fork in good working shape. There was a little drawback caused by the machinery not being in good order or the mill would have been running now. It is expected, however, to have everything running systematically by Monday or Tuesday. They have about 100 tons of ore out and Mr. Junkans, the owner, is looking forward with a great deal of interest to the first clean-up.

THE RIDGEWAY.—News has been received from New River that the Ridgeway Co., have made connection with their old shaft and as a consequence work will progress much more rapidly now. For sometime the air has been very bad in the tunnel and upraise. The ledge runs from four feet upwards and will probably go not less than \$20 per ton. They are now getting ground opened up for systematic working. A test run will be made of the rock sometime this month.

NEVADA

Washoe District.

CDNS. CAL. AND VIRGINIA.—*Chronicle*, August 1: There has been extracted from all parts of the mine during the week 1681, 1410-2000 tons of ore, of which 122, 910 2000 tons was shipped to the Morgan mill and 1550 500-2000 tons to the Eureka mill. The average assay value of all of the ore worked at these two mills during the week (2285 tons) was \$24.50 per ton. Bullion shipped to Carson Mint, assay value \$47,762.97. Bullion now on hand in our assay office, assay value about \$26,500.

OPHIR.—1465 level: We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of

this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. All the ore on hand which had been accumulated from recent exploration, amounting to 259, 1860-2000 tons, has been shipped to the Morgan mill and it is now being worked at that mill.

MEXICAN.—On the 1465 level the south drift started from the east crosscut No. 1, at a point 618 feet from the main north lateral drift has been advanced 35 feet; total length, 92 feet; in vein matter showing clay separations.

UNION CON.—The northeast drift started from the east crosscut No. 2 on the 1465 level, at a point 833 feet from the main north lateral drift has been extended 30 feet; in vein porphyry carrying some clay.

OCCIDENTAL.—Extracted 40 tons of fair-grade ore from the stopes on the 350, 400 and 450 levels, and 10 tons per day from the 600 level. The south drift from No. 2 crosscut on the 650 level is in ore of the average value of \$22 per ton. Milled during the week 325 tons of the average value of \$17.30 per ton.

UTAH.—At a point in the south drift, 52 feet from the winze station, a southeast drift has been advanced 46 feet in porphyry and clay.

ANDES.—On the 420 level east crosscut No. 2 from the main north drift was advanced 21 feet; formation porphyry. East crosscut No. 3 was extended 30 feet and discontinued. From east crosscut No. 3, 85 feet from the main north drift, a north drift was started to-day in quartz.

CHOLLAR.—The station at the 1500 level is completed, and are now sinking for a chute. Extracted and sent to the mill the past week 520 tons of ore, worth \$19.40 a ton as per battery samples.

POTOSTI.—The winze is down 67 feet below the 1500 level. The bottom is in porphyry and stringers of quartz.

ENCHERQUER.—East crosscut on north line, 600 level, is out 270 feet; face in porphyry.

BULLION.—The south drift, 1300 level, is out 290 feet from north line; face in clay and porphyry.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level, is out 52 feet; face in quartz yielding low assays. South drift from winze, 80 feet north of shaft, 550 level, is out 47 feet; face in quartz, yielding low assays.

WARD SHAFT.—The south lateral drift from the 1800 is out 184 feet; face in porphyry.

NEW YORK.—West crosscut from north lateral drift 600 level, is connected with the raise from the 800 level. The west crosscut from the north lateral drift, 590 feet north of shaft, 1100 level, is out 20 feet; face in porphyry.

SILVER HILL.—The southwest drift, 50 level, is out from the shaft 220 feet; face in porphyry. South crosscut, 160 level, is out from the winze 640 feet; face in hard porphyry.

SIERRA NEVADA.—On the 630 level, west crosscut No. 1, from the northwest drift, 571 feet from the shaft, is advanced 761 feet, 37 feet having been made during the week, continuing through the same formation.

GOULD & CURRY.—On the 200 level upraise No. 2 from north drift has been carried up 11 feet; total 106 feet; face in quartz showing some value.

Hawthorne District.

LAPANTA.—Walker Lake Bulletin: Stope above the east drift, No. 6 incline, still producing the usual amount of high grade ore. East drift from the winze below the 100-foot level has run into a large body of iron and quartz, running about \$30 per ton, the body being evidently quite extensive. Sinking on a small vein of high-grade ore below the west drift, No. 6 incline.

PAMLILO.—Main tunnel has intersected the vein driven for; same shows about two feet wide, pitching northeast.

CENTRAL.—Extracting ore as usual. Shipped two cars of ore this week.

MOUNTAIN KING.—North drift on the main ledge tunnel level has been extended ten feet; the vein about two feet wide; ore improving in quality.

FAIRMOUNT.—Driving the main south drift ahead; vein about two feet wide, carrying streaks of quartz and metal all through the same. The winze below the drift is down 30 feet—the vein running from four to eight inches high-grade ore.

HARTFORD.—Still opening the vein on the surface, showing good ore.

CAPITAL.—Working on the feeder; expect to reach the ledge in a few days. Encountered antimonial silver of a high grade.

GOLD BAR.—South drift, Martinez level, still being extended; ledge about ten inches wide, carrying some very high-grade ore.

IDA.—Still producing the usual amount of ore.

NEW YORK.—South drift from the tunnel being extended on the vein, which shows about 18 inches wide in the face, a considerable portion of which is heavy galena.

RIP VAN WINKLE (Marietta).—Main tunnel has been extended eight feet, showing six inches of galena ore in the face.

JENNY LIND (Marietta).—The northwest drift has been extended six feet; the vein about 24 inches wide; 65-ounce ore.

Tuscarora District.

NEVADA QUEEN.—Times Review, July 31: South drift from east crosscut, 414 level of Commonwealth, has been advanced 11 feet.

NAYAJO.—South intermediate level extended 19 feet; the face is not looking well.

DEL MONTE.—Third level—No. 1, north drift advanced 20 feet; assays from face as high as \$32.75 per ton. No. 2, north drift advanced 21 feet; vein 5 feet wide; ore showing all through.

COMMONWEALTH.—Fourth level—No. 1, winze is down 28 feet, passed through the ore 15 feet below the level; winze will be continued straight, as there is less water than in the ore, and crosscut at 50 feet.

BELLE ISLE.—Line crosscut, 350-foot level, extended 17 feet; rock is getting harder, and progress is slower. The winze on this level has been extended 25 feet; the vein is strong, but not so rich. Seventy feet of the Williams crosscut, same level, has been cleaned out. Work has been resumed in the line crosscut, 450-foot level.

NORTH COMMONWEALTH.—First level—Stopes have yielded 10 cars of ore; average assay, \$300 per ton. Third level—No. 1, winze extended 6 feet and north drift from bottom, 12 feet. No. 2, raise extended 15 feet, cutting about 3 feet of ore, some of which is high grade.

NORTH BELLE ISLE.—East crosscut from the south gangway, 400-foot level, extended 14 feet. The upraise on the east vein, same level, extended 9

feet in hard rock, showing many seams of good ore. West crosscut from the north end of Belle Isle, 450-foot level, extended 14 feet.

Pioche District.

PROSPEROUS.—Pioche Record, July 30: Ed. Robinson, of Patterson district, was in town during the week. He reports the mines in that district as having a most prosperous outlook. Mr. Robinson brought some hand-samples into town which assay very well in lead and iron. The ore in the Patterson district has heretofore been of a milling character, but he now has some good smelting ore.

ALASKA

SHEEP CREEK.—Juneau Mining Record, June 29: The Silver Queen Co.'s mill recently built has ten stamps and four concentrators and its arrangements are complete in every particular with a sufficient water power to operate a plant many times larger. The stamps were made by the Risdon Iron Works, S. F., and were taken from the mill erected on the celebrated Bear Nest property on Douglas island which failed to hear the anticipated golden fruit. The mill was pronounced by those who are familiar with mining as one of the best mills they have come in contact with on the coast. The ore is brought in wagons from an ore bin about one mile from the mill where it is run down in a chute from the tunnel. The ore is of a first-class milling quality and about 30 tons is crushed daily. It is the intention of the company to put in a track tramway for the delivery of the ore from the mine to the mill which will greatly reduce the cost of ore transportation.

ARIZONA.

TOO MANY MINERS.—Tombstone Prospector, July 31: A. L. Walker, superintendent of the Old Dominion Copper Co. advises miners and all laborers to give Globe a wide berth as there are now ten applicants for every vacancy.

GLOBE.—Cor. Florence Enterprise, July 27: Globe is very quiet but many say it is the best camp in the territory. The Old Dominion is progressing finely with the foundation for three massive new 80-ton smelters. Everybody, nearly, thinks that it will bring a railroad. The Rescue mill is now pounding ore day and night with several hundred tons on the dump ready for the stamps and a good force taking out more. The general opinion is that the Rescue is a permanent property. In the Fame a good pocket has been struck lately but the matter is kept quiet.

BRITISH COLUMBIA.

ON TOAD MOUNTAIN.—Nelson Miner, July 25: The Dandy Co., in stripping the ledge above the lower tunnel on the Dandy, last week uncovered a body of fine-looking ore, which gives higher returns than that from the surface on the upper end of the claim. The road has been swamped and the stumps blown out, so that machinery can now be got on the ground. At the Grizzly Bear, the tunnel face is under cover, charcoal is being burned and the boarding-house is almost completed. On the Vineta Boy, Ben Thomas, Charles Malley and John Connors are sinking the shaft, now down about 30 feet, 50 feet farther. At the Cumberland, a claim recently discovered by Harry Ward, Charles Dundee and A. R. Seaman, a shaft is down several feet in ore that shows grey and peacock copper. The ledge is reported to be fully six feet in width and apparently in place. The manager of the Kootenay Bonanza M. Co. advertises for tenders for from 250 to 500 feet of tunneling on the Silver King, which means that the owners of that property want to know what they really have before they accept any of the offers made for it. The wagon road is completed to within a short distance of the summit of the mountain, and will be at the Silver King next week. About 60 men, besides those employed on the wagon road, are working for wages on the several claims on Toad Mountain. The only sale reported this week was the Lulu, a claim adjoining the Silver King on the north, to E. Ramsay, manager of the Kootenay Bonanza Co.

HOT SPRINGS DISTRICT.—Ore is being hauled from the Number One mine to the landing at Ainsworth for shipment to the smelter at Revelstoke. Over 200 tons are now sacked, and the contractors expect to haul from 6 to 10 tons a day. The mine continues to look away up, as does the Fourth, in the same camp. The Skyline crosscut had not reached the ledge up to Wednesday night.

DAKOTA.

SMELTER BLOWN IN.—Deadwood Pioneer, July 30: At 3:30 yesterday afternoon the D. & D. smelter was blown in, or, more properly speaking, the big blast furnace was charged with coke, limestone, pyrites and ore from the Maggie mine and a lighted torch applied. The machinery has all been in operation for the past ten days and the large bins filled with crushed ore, limestone and pyrites. Dr. Carpenter was seen at 8 o'clock last evening and said that apparently everything was running as smoothly as could be desired. It will be run with eight and day shifts. The boiler that supplies the steam for the motive power only consumes three tons of Newcastle coal every 24 hours. The most remarkable thing about the construction of the plant is that not a pulley, piece of shafting or other machinery had to be changed from the original setting or position. It was all planned by and set up under the direction of Dr. Carpenter.

IDAHO.

A RICH FIND.—Wood River Times, Aug. 3: Col. Wall, special agent of the General Land Office, got back from the upper country to-day. He reports that the best strike ever made in that country was made three or four days ago by John Christenson, at a point about four miles from Bay Horse, and within a claim or two of the Ramshorn mine. The vein is very wide and so easily worked that two men can extract more ore than four men can hoist. The ore is very rich.

THE NETTIE MINE.—E. H. Porter, managing owner of the Nettie mine, which is at the head of Narrow Gauge gulch, and reports having 14 to 18 inches of ore that runs 200 ounces silver and 60 per cent lead, and they have 75 feet of backs to stope

on this. The mine has paid the owners at the rate of \$1300 per month in dividends while doing dead-work, such as sinking a winze, and now that it has been opened so as to have large stoping ground there is big pay in it. Ore is being shipped.

PLACERS NEAR ELK CITY.—Spokane Chronicle, July 31: Mr. C. D. Galvin, agent for the Chicago Board of Trade, arrived a few days ago from Elk City, Idaho. Mr. Galvin is an interested party and also the agent of one of the largest placer mining companies that is operating in that part of the Territory. The intentions and operations of the company have been kept secret for some time, but now its plans are fully matured and everything in readiness for work. The country in the vicinity of Elk City has been famous for many years as a region of rich placer mines. The Chicago Board of Trade has purchased contiguous claims in that section to the amount of 950 acres, and will put in an extensive placer mining plant. "For a time," said Mr. Galvin, "we kept quiet about our doings in the placer region, but now we are ready to talk, if the people want to listen. We have all the claims we want, and we are satisfied that they contain immense quantities of gold. We intend at first, however, as a precaution, to work three or four acres in a primitive way, by scraping off the top of the soil until we reach the pay gravel, and then we will wash it out in old-fashioned sluice boxes. If it pays half of what the prospects have all along indicated that they would, we will go on with the work. We have an abundance of water handy, and the land lies in a most advantageous position. Mr. A. B. Stetson, the engineer in charge for ex-Governor Taylor of Montana, who is also working a placer mine, will be here to-morrow, and will visit the property with a view of making the necessary estimates, etc., for the plant, which we expect to cost about \$40,000."

BUNKER HILL AND SULLIVAN.—Wardner News, Aug. 1: In a few days the Bunker Hill & Sullivan M. Co. will commence grading a site for another concentrator equal in size to the one now in operation, which will increase the concentrating capacity of the works to 800 tons per day. The company are encountering in their mines low-grade ores which will yield profit only by handling on an extensive scale, and the addition to the mill is made with a view to treating such ores as have been heretofore profitless. The increase in the capacity of the Bleichert tramway from the mines to the mill has been completed and ore is now delivered at the rate of one ton per minute, and in a few days mining timber and cordwood will be brought up in buckets on return trips to the mines. The new concentrator will be built substantially upon the same plan as the present one, which has proved so remarkably successful. The only change in note will be the adoption of the Gates crushers in place of the rolls. This will be an entirely new feature in this class of mining work. The company is encouraged by the great success attending the use of these crushers at the mines, where the "Gates" crushes 150 tons of ore per hour as it is dumped from the cars, or 7½ times as much as a 9x15 Blake does by its side. The arrangement of the Gates will be such as never to require any stoppage of the mill for repairs on these machines. There will be 32 jigs of from two to four compartments, two double-deck slime tables and four Frue vanners. Power will be generated from a 30½ Lefell wheel. The ore will be conveyed to this new plant from the present ore bins by an endless iron trough conveyor, feeding into the Gates crushers. Screens and hydraulic classifiers will be used for sizing as practiced at present. In place of belt elevators, the Morris reversible centrifugal pump will be used for returning middlings, etc., to the screens. These pumps are made specially for the work, being cast 1½ thick. The mill will be in operation by the first of next January.

MONTANA.

AT BUTTE.—Miner, July 30: Activity among the mines, mills and smelters during the week has been as great, if not greater, than it has at any time within the last four years. The Lexington, Alice, Bluebird, Moulton & Butte and Boston companies shipped their regulation weight of silver and gold bullion, in addition to the Colorado, Butte Reduction, Boston and Montana and Parrot shipped many tons of copper, several thousand pounds of silver and a few pounds of gold in the conglomerate mass known as matte. This latter product is always shipped as freight and its exact weight is not therefore generally known. The coming week promises to be even better than the one just past, as several new leases and other properties will be started up. During the week the Butte & Montana Co. came to the front with dividend No. 13, which swelled the total amount from date of organization four years ago to \$2,075,000. In addition to this the company has about \$1,000,000 surplus on which it is drawing for the building of the new smelter at Great Falls. At the old Colusa smelter a few changes are in progress with a view to putting the furnaces in better condition. At the St. Lawrence mine two large steel tanks are hoisting the water from the shaft and lower workings, which yet contains about 400 feet. At the Anaconda, one tank is kept running steadily. There is a rumor in the air to the effect that work in these two mines will be resumed in about three weeks, at which time it is thought the water will all be out, but it is a rumor only. The 1400-foot station of the Alice shaft will be finished to-day and sinking for the 1500-foot level will be continued without interruption. The machinery for the new air-compressor is arriving, and in a few days the property will be supplied with as good a piece of machinery of this kind as can be found anywhere outside of the Comstock mines. For the last few days the Magna Charta and Blue Wing mines belonging to the Alice Co. have been working only about half time. The reason for this is the fact that the Alice proper is yielding more ore at present than it has at any time since the company assumed control of it. The Butte & Boston Co. is one that has accomplished marvels since its first commencement of operations in this district. From its No. 1 mine near the Silver Bow mill it has for some time past been taking out between 9000 and 10,000 tons of ore a month, which is all treated at its smelter here. A great deal of matte is turned out by it monthly. It is safe to say that the record of this company in the three years of its existence has not been surpassed, if equalled, by any other in the State at the same stage of development of its mines.

NEW MEXICO

IRON.—W. H. Newcomb's iron shipments from here have averaged 150 tons per day for the last 20 days. Jo. Avery and others, who have been leasing on the Flagler mine, shipped a carload of ore this week. The Maud S. Silver Creek mill is being put in shape and will soon start up. A big body of ore, over 18 feet in width, has been struck in the Last Chance. It averages from \$15 to \$19 per ton. The Anson S. Smelter will blow in Monday next. Frank Miltstead and Max Schultz have secured a lease on the Bremen mill, and are now putting it in shape. They will work custom ores. Teams were sent to Carlisle this week for a hoisting plant purchased from John A. Miller, which will soon be put in place on the Hohson group. John S. Dodd, manager of the Alhambra, came in Tuesday from the mine, bringing ten tons of rich ore, which was shipped to Socorro for treatment. John Bragaw was over from Georgetown this week to ship a car of rich ore to Socorro. He will soon add two vanners to the Payne, Washington & Co.'s mill and start up on low-grade ore, of which he has a large amount already on the dump.—Silver City Enterprise, July 31.

OREGON.

CLEANUP.—Jacksonville Times, Aug. 1: The annual cleanup is now progressing at the Sterling mines. E. Sanderson Smith, the well-known mining expert, has been in Josephine county looking for asbestos, and brought home several specimens. Asbestos is being searched for by many in Southern Oregon, and if a large deposit of a merchantable article is discovered, it will be a big thing for all concerned. The San Jose capitalists who recently bonded the Pilgrim ledge on Wagner creek have concluded not to take the property, although they admit that it must prove valuable when developed. They are looking for property that is already opened up for work. The great nickel-silver mine near Riddle station is beginning to attract general attention, the vast body of ore to be there found, exceeding anything of like character to be found in the State, or perhaps on the Pacific Coast. The entire mountain seems to be one mass of high-grade ore, which teems with undeveloped wealth.

ASBESTOS.—Daniel Reynolds of Evans creek, one of the original discoverers of the asbestos mines, is in town. He informs us that Mr. Tyler, in the interest of a Tacoma company, has located a large quantity of ground in that vicinity and will soon work it on a large scale. Mr. R. has located claims with several others, and showed the reporter a handsome specimen of the material. There seems to be every probability that the asbestos has been found in extensive and paying quantities.

UTAH.

NEW LOCATIONS.—Park Record, Aug. 1: Con. Hunt, Geo. Roberts and a man named Fife have made several locations recently in the Bear River mountains, about 50 miles from Park City. They have uncovered a vein of mineral about four feet wide, with regularly defined walls, that looks quite promising. Mr. Hunt brought some of the rock to Park City, and is having it tested for silver and gold. The work of sinking the new shaft on the Meears is going forward rapidly. A steam hoist is in position and 135 feet have been sunk in 18 days. Three shifts are working. The water at the Silver Key is increasing instead of diminishing, and work in the face of the tunnel is being carried on under difficulties. Repairs at the Mackintosh sampler have been completed, and the mill is again in active operation. The changes in the machinery consisted in a rearrangement of the conveyors in such a manner that the labor of three men is saved on that piece of machinery alone; besides, it makes the whole mill much more convenient and commodious, and ore is handled much easier and more speedily than of yore, and yet Mr. Rookledge says it keeps everything moving constantly to handle the ore that is now coming in.

ORE AND BULLION SHIPMENTS.—The Ontario mill shipped this week 35 bars of bullion, containing 22,598.74 fine ounces of silver. The Crescent shipped this week 220,500 pounds of first-class ore and 268,500 pounds of concentrates; total, 489,000 pounds. During the past two weeks there has been received at and forwarded from the Mackintosh sampler the following lots of ore: Ontario, 741,650 pounds; Daly, 602,150; Anchor concentrates, 768,330; Roaring Lion, 18,210; Nevada-Northland concentrates, 18,860; Wedge, 230,180; Alliance jig ore, 12,380 pounds; total, 2,391,770 pounds.

WASHINGTON.

KITTITAS CO.—Ellensburg Capital: At no time in the history of Kittitas county has there been so much interest in and excitement over mines as at the present time. Hardly a day passes that pack horses are not seen on our streets loaded with supplies for the sanguine prospector, whose hunger for wealth has been increased by the reports which are being constantly received from the surrounding camps. These prospectors are not all Ellensburg people, but they come from all directions, particularly from the Sound region, where the fame of our mines is being circulated, and where many are to be found who believe in them and prove their faith by trying to get in to time to secure a share of the precious metal which they believe we possess. This is not an undue excitement, but is a long-deferred waking up to the important fact that Kittitas county has the richest mines and more of them, of all kinds, than any other county in our great State. It is a natural result which should have been demonstrated years ago, and which, in any other country, would long ago have created a furor. Our county has heretofore enjoyed the reputation of being a great placer region, and on this score most of its fame has been achieved. It now seems, however, that the placers are of small importance compared with the rich ledges of gold and silver-bearing ore which are constantly being discovered. Already these miners are crying for mills to work their ores. They themselves, as a class, are unable to put up mills, but it is not probable that they will have to wait long, for capital will be quick to see what a fine investment is offered in this line, and it is safe to predict that stamps will be dropping in the mountains before snow flies. All these features indicate that Kittitas county is now entering upon an era of prosperity such as she has never known, and will soon be famous as a producer of precious metals.

MECHANICAL PROGRESS.

Modern Inventive Activity.

One of our valuable exchanges remarks that down to the beginning of the last century men had invented very little. They had necessarily contrived a great deal. They learned to make boats so far back in the legendary ages that history could only find a place for beginning after men had been taught to navigate the sea. But then the boat is only an evolution of the log floating on the water, and it came into form by such easy gradations through the raft that it is hardly to be called an invention. So with most of the household implements, and even of the tools of mechanics that have long been in use. They grew by such slow processes from the crudest beginning that no man could be called their inventor. As we look back beyond the beginning of the last century, we discover barely more than a half-dozen new devices that could justly be called inventions. The art of printing is the most conspicuous of these few; but even this invention was so simple that one cannot help feeling that the old monks who copied manuscripts for centuries must have been exceedingly stupid, or they would have created the art at a much earlier date.

But the inventive activity of the present age is a source of continual wonder, and it is difficult to explain the impulse that leads to its indulgence. Much is attributed, and much doubtless is due, to the patent-right system; but this will not explain everything. A few fortunes have been made by inventors; but it is notoriously true that the authors of new inventions rarely realize much for their happy thoughts, and few men would ever think of turning their attention to invention as a profession. Vastly the larger number of inventions are the work of men who have merely conceived a good idea, and then proceeded to put it in mechanical form because their idea has made them enthusiastic. In such cases they may have been stimulated somewhat by the hope of pecuniary reward; but it was not this hope that gave the impulse to their labor.

A WONDERFUL MECHANICAL PROCESS.—The process of rolling railroad rails, of Bessemer steel, as practiced in Germany, is declared to be one of the most perfect mechanical operations in the world. The steel is cast in hocks which contain sufficient material for two or three rails, these hocks, while red hot, being carried to the preparatory rolling mills by horses which have been trained to work in the midst of this fire and noise; here they are kept hot, in special furnaces, and are rolled into longer hocks having a square cross section. After being thus prepared, they are taken to the rail rolling mills, which consist of two complete rolling mills, with all the appurtenances in one apartment, and the hocks which come from the preparatory mills are heated again and then passed between the rollers, of which there are three placed one above the other, so that the rails are rolled during the backward as well as the forward motion without requiring a change in the direction of rotation of the rollers. The rails have to pass back and forth between the rollers 13 or 14 times, and each time that they come from the rollers they are caught by the workmen on the short, bend ends of long levers which run on rollers on movable carriers. Each time the rail passes from between the rollers it is longer and its cross section narrower than after the former rolling, until it finally stretches itself out like a gigantic fiery snake; it is then taken to a circular saw, which cuts through the glowing metal with perfect ease, dividing the long bar into two or three rails. The cold ring is now put under presses, by means of which the slightest irregularities are removed, and then the holes are bored, the end surfaces evened, etc.

WOODEN JOISTS VERSUS IRON FOR BUILDINGS.—In his recent lecture on fire prevention, Professor Goodman states that, generally speaking, wooden joists are better for building than steel or iron joists. The two latter materials, he explained, lose their strength at a not very high temperature, whereas wood would sustain a heavy strain for a much longer period when exposed to great heat. Besides, when wood has once been charred, it does not burn so readily again. Iron and steel soon expand under the influence of heat. Brick and stone are objectionable; the former become fused under great heat, and the latter is liable to crack or fly when suddenly cooled after heating. The drawback to tiles is that when fire plays upon the joists of floors fitted with them, the joists expand and allow the fire to play upon the joists through the tiles. Portland cement is objectionable, as it flakes off when heated, but if wire netting or bars are imbedded in concrete, this defect is remedied. A joist padded with elastic of cotton and incased in Salamander plaster (a mixture of allstate, cotton and plaster of Paris), the professor holds, is a splendid fire-proofing material. Such a material is not only a non-conductor, but it is elastic, and would yield with the joist. In an experiment undertaken by Professor Goodman, it was found that a joist of this kind withstood fierce heat for eight to nine hours without sustaining any serious damage.—*The Builder*.

MONSTER GUNS.—Two monster Russian guns were sent recently to Sebastopol for the purpose of being placed in the new ironclad

Sinope, and although some of the details must be inaccurate, the official description is too interesting to be ignored. They are 12-inch pieces, weighing 50 tons, and throwing projectiles of nearly half a ton. The powder charge is 270 pounds, and the initial velocity 3000 meters, while the distance of the cannon's range is said to be 20 versts, or over 13 miles. As a consequence, the fire of the guns can only be directed by the map, the object fired at being out of sight. Two men, however, suffice for each gun, as they are worked by hydraulic machinery.

ALUMINUM COMING INTO USE.—The low price at which aluminum can now be produced is beginning to interest manufacturers and inventors in devising ways and forms for introducing it into practical use. The Electrical Supply Co., of Chicago have demonstrated the value of this metal, for the manufacture of certain lines of goods at least. They have recently brought out aluminum shade for incandescent lamps, which is said to be very handsome in appearance, being of a beautiful silvery white color and extremely light. The interior of the shade has a frosted surface, which has the effect of casting a strong and soft light upon the desk. The light is of such a character as to be very restful to the eye and there is no strain whatever imposed upon the organ sight. This new shade, no doubt, will be much appreciated by those who are desirous of securing a soft, diffused light to work or read by. The New Process Welding & Spinning Co., of Chicago, are receiving a great number of inquiries as to their new method of welding and shaping metals by means of the heat generated by friction. They have just completed some interesting practical experiments with aluminum, and are able to make perfect tubing of any desired diameter and length, out of sheet aluminum. It would appear that their patents are almost as valuable in working this wonderful metal, as in fashioning brass and copper. Parties in one of the Eastern cities have in process of construction a small steam yacht calculated to carry four persons, the whole of which, with its engine and propellers will be constructed of aluminum. The weight of the boat and engine will be only sixty four pounds. This will form a very interesting experiment.

PIPE DIRECT FROM BAR IRON.—Experiments have been going on at the Alikanna mill, Steubenville, O., for some time, on making pipe direct from bar iron. This plant is owned and run by the National Tube Works of McKeesport, and the machinery used in the new process was bought in separate pieces, so that their intention might remain a secret. This new departure in making pipe directly from steel bars will practically revolutionize pipe-making and the old way of rolling the iron into a sheet then curving and welding it, will be entirely superseded. The managers say machinery has been ordered to be placed in the tube works at McKeesport, where the new process will be used.

THE CORE SAW, intended for boring out barrels from solid logs, was recently completed at Taunton, Mass., for a company in Lacrosse, La. The saw is made of wrought iron, cylindrical in shape, and steel outer teeth are distributed about its edge. It was expected that the saw would cut a barrel per minute, and during a trial of the first machine a core 10½ inches in diameter and 21½ inches long was bored out in 30 seconds. A mill for the manufacture of barrels by these machines is to be built in Louisiana.

THE TWISTED WIRE NAIL.—A cross between a screw and the ordinary plain wire nail—is said to be working its way into popular favor, and is believed to represent as great an improvement upon the plain wire nail as that useful invention is over the old cut nail. The twisted wire nail not only crushes the fibers of the wood less than the two other forms of nail, but by its screw shape possesses a much greater holding power than the other forms.

AN AMERICAN BLAST FURNACE has recently been put up in England, as a matter of test between American and English furnaces. The furnace has been erected on the Tyne near Newcastle. The furnaces from which this one is modeled have produced 2500 tons of iron in a week, which is double as much as has been turned out in English furnaces. The result of the test will be looked for with much interest.

ALLOY IN COINS.—Americans use an alloy of one-tenth copper in making coins to harden them. The English use less—one-twelfth. Some time ago, the English Government filled two spinning cylinders—one with English coin and one with American—and set them both revolving. The former wore away much more under the shaking than the American did.

THE LARGEST GUN.—The credit of having manufactured the largest gun in existence is claimed by the Krupp Company. The gun, which is the property of the Russian Government, is made of cast steel, weighs 235 tons, and has a caliber of 13½ inches, and a barrel 40 feet in length. It fires two shots per minute, and each charge costs £300.

BILLS are now posted in Paris by machinery, which is said to be an improvement on the hand posted system.

SCIENTIFIC PROGRESS.

Science and Society.

The marvelous transformation that is being wrought in the civilized world by electricity is one of the wonders of all ages. No revolution in mechanical science ever affected society as does that wrought by electric power. It touches life at every point, modifying, extending, transforming all the methods of intercommunication. Space and time, which are the two attributes that limit all expression of life, are practically annihilated by this power. When one remembers that it is these very conditions of space and time that the philosophers have always instanced as differentiating the material from the immaterial worlds, one realizes how vast and even sublime is the force that overcomes them.

Within the past decade electrical science has made greater progress than in the preceding half-century. There is almost no industry or mechanism carried on to-day without its aid. But the outlook in the immediate future transcends any realization of the past. The street cars, and, in time, the railroad trains will inevitably be propelled by electricity. Houses will be lighted and heated by the electric spark, and we shall turn on the heat as we now turn on the gas, thus doing away with smoke, which of itself will have an important effect on the cleanliness of a city, and also on the health of the people.

The pneumatic tube must eventually solve the package transportation problem. If it solves package transportation there is no reason why it may not solve freight transportation as well, and the new invention to reproduce in facsimile every word and line of a letter, as it is being written, to the person addressed, by means of an upright immovable rod, fastened to the top of a writing desk, will certainly facilitate the swift delivery of mail matter. This last feat is now in use in New York between that city and Pittsburgh, and is an invention patented by Henry Etheridge, a noted electrician. The stylus with which the letter is written is fastened to the upright immovable rod at the top of the desk, and this, by electric connection, reproduces the writing exactly before the eyes of the distant correspondent.

Mr. Edison's new wonder should not be overlooked in this connection. To use his own words, he says: My intention is to have such a happy combination of photography and electricity that a man can sit in his own parlor and see depicted upon a curtain the forms of the players in opera upon a distant stage, and to hear the voices of the singers. When the system is perfected—which will be in time for the fair—the play of each muscle of the singer's face will be seen, every color of his or her attire will be exactly reproduced, and the stride and positions will be as natural as those of the live characters. All this will revolutionize all the means and methods of social life.—*Ez*.

The Tides.

The ocean tides, notwithstanding the amount of scientific search which has been turned upon them, are still largely an enigma, even to the scientists. There are phenomena connected with them which are difficult of satisfactory solution. All the phenomena connected with them have in all ages excited much curiosity. The difference of height at one time and another is a puzzle to many, although to the educated that phenomena is perhaps well understood. The usual extraordinary height and fury of the tides in some places is a wonder to many and is an interesting sight to all.

It is related of the soldiers of Alexander the Great, who were natives of the Mediterranean shores, that when they reached the confines of the Indian ocean and saw its waters rolling up to a great height, and then flowing back twice every day, they became alarmed and attributed the phenomena to a special interposition of the deities of the country which they had invaded. Various remarkable theories have been advanced regarding the tides. Many of these are truly as absurd that it is hardly worth while to refer to them. Persons find it difficult to understand why the tides are higher at one time than another, and why they rise to the height of 60 feet in the Bay of Fundy, 40 feet in the ports of Bristol, England, and St. Malo, France, and only rise to a few feet in New York and other places, while they are scarcely perceptible in the Baltic and other seas. Descartes was the first philosopher who advanced the theory that the tides were due to the influence of the moon, but Newton was the first who worked out the problem and discovered the true cause. Descartes held that the moon acted on the waters of the ocean by pressure. Newton demonstrated that it acted on the ocean by attraction—that instead of pressing the waters, it rolled them up directly under it, and also at its antipodes at the same time, thus producing the two tides every day.

The tides are attractions of both the sun and moon. If the earth had no moon, the attraction of the sun would produce two tides every day, but their ebb and flow would take place at the same hours, not varying as they do. These tides would also be much smaller than those of the moon. Although the mass of the sun is far greater than that of the moon, and though attraction is in proportion to the mass, yet it is also inversely as the square of the distance. As the sun, therefore, is 400 times

more distant than the moon, the attraction of the waters of the sea toward the sun is found to be about three times less than that of the moon. There are really two ocean tides—the lunar and solar—but the latter is absorbed by the former, which is wholly observable in respect to the time; the solar only as it influences the height of the tidal wave. That caused by the moon is three times greater than that of the sun, and it follows the moon's motion around the earth, rising and falling 12 hours and each succeeding tide later by three-quarters of an hour than the preceding one, exactly in accordance with the positions of the moon, or, as it is commonly called, its rising and setting.

NEW FISHES.—The *San Diegoan* of recent date says: Since the return of Dr. Carl Eigenmann, the ichthyologist, two new fishes have been discovered and named. The first was found by the dredger at work cleaning out the entrance to the harbor. With the sand the dredger brought up what the workmen called a worm, but which the ichthyologists called amphioxys lanceolates, which, it will be readily observed, is quite different. It was further shown that the workmen were wrong in calling it a worm, for worms are invertebrates, while the amphioxys lanceolates is a true vertebrate. How the workmen could have made such a gross error is not readily understood. The things are found imbedded deeply in the sand under the waters of the ocean. They are from two to three inches long, have a corporeity about the size of a lead-pencil, are almost transparent, are blind, and are otherwise interesting, but not known to be especially useful. They are found on certain portions of the coast of Florida, but are very rare. Another new fish, which the Chinamen describe as the "porcupine fish," has also been named by Dr. Eigenmann, and he calls it a specimen of the chilmysterus, which is very much different again. The fish is about ten inches long, white below and blue and black above. It is covered with spines like a porcupine. Dr. Eigenmann says this is the first specimen found in the Pacific Coast waters.

OBSERVING THE FORMATION OF HAIL.—A direct observation of hail in the process of formation is recorded by Prof. Tosetti, who, in the afternoon of a squally day, looking eastward through the window of a house in Northern Italy saw the rain which streamed down from the roof to the right caught by a very cold wind from the north and driven back and up in thick drops. Suddenly a south wind blew, and the drops, tossed about in all directions, were transformed into ice-hails. When the south wind ceased, this transformation also ceased, but whenever the south wind recurred the phenomenon was reproduced, and this was observed three or four times in ten minutes.

THE IRON AGE was an age of higher civilization, and merges into the age in which we live. When men commenced to work in iron, every experiment they tried added to its value, and as their knowledge of the metal and its uses increased, they advanced civilization. Warlike as they were, they made knives, axes, helmets and coats-of-mail, but at the same time they made the tools for the field and the utensils for home use—the gentler improvements that were to triumph in the end. They put the true precious metal, iron, daily to new uses, and probably man has not yet found out all the ways in which it can be used.—*St. Nicholas*.

IN THIS AGE OF SCIENCE, the people have an idea that we know so much now there is nothing more to be discovered. Why, we are yet in our infancy as far as electricity goes. New discoveries will yet be made, and we will live to see them put into practical use, which will revolutionize the entire world. The experiment which we are about to make in telegraphy is only a feeler, which will lead to other and more startling experiments. The establishment of telephone communication between the hemispheres is already being seriously discussed.—*Philadelphia Record*.

CLOUD PHOTOGRAPHS.—Many remarkable data of immense value in the preparation of weather forecasts, have lately been secured by cloud photographs. The range of observations extended from clouds floating less than one and one-half miles high in air moving at seven miles an hour, to nine miles above the ground in gales blowing 65 miles an hour, while the surface wind was only a gentle breeze of five miles an hour.

TELEGRAPHY WITHOUT WIRES is said to have been accomplished in England. Mr. Preece, the head electrician of the postal system, succeeded in establishing communications across the Solent to the Isle of Wight, and telegraphed also across the river Severn without wires, merely using earth plates at a sufficient distance apart. It is now proposed to make a practical use of this system in communicating with light-ships.

COLORING MATTER IN COAL.—The amount of coloring matter in a pound of coal is enormous. It will yield enough magenta to color 500 yards of flannel, vermilion for 2560 yards, aniline for 120 yards, and alizarine for 155 yards of Turkey and cloth.

The first telescope was used by Hans Lipperheijn of Holland in 1608.

GOOD HEALTH.

Cancer Making and Cancer Curing.

The people of Berlin have recently been treated to a new horror, which is nothing less than a charge against several of the most prominent medical professors of that city, that they have been engaged in practicing experiments upon patients in the Berlin hospitals to ascertain whether or not cancer can be propagated by injecting cancerous fluid into healthy human tissue! The charge made is in the following words:

"I charge Prof. Eugene Hahn, chief surgeon of the surgical division of the public hospital at Freldehshain, and Prof. Von Bergmann, chief surgeon of the Berlin University, with having overstepped all bounds of their high professional calling and duty by ingrafting on or injecting into the patients under their care, and without the knowledge of the said patients, cancerous embrocations, and in this way artificially producing cancerous disease where it did not before exist."

Some of the German medical men approve of such a practice as experiments in the aid of science. Dr. Paul Gblier, of the Pasteur Institute, has made a study of cancer, and was free to express himself upon the German experiments, as follows: "My opinion is that the conduct of the German professors is culpable in the extreme," he said; "besides, they could show nothing. It has been a well-authenticated fact for years that cancer can be transplanted."

Physicians connected with hospitals in New York say that no such experiments have ever been undertaken in any of those institutions. We hope, for the sake of humanity, that the assertion is correct.

Dr. William M. H. McEwen was of the opinion that cancer was a constitutional disease. That opinion seems to be fast gaining ground among medical practitioners everywhere, and when it becomes general the surgeon will have to lay down his knife and the quack his plaster, for neither can be of any benefit in constitutional treatment.

It will then be in order for the Faculty of this city to cease their foolish cry of quackery and humbuggery against the "San Francisco cancer remedy," which is one of pure constitutional treatment and of undoubted success, notwithstanding the constant reiterations of the doctors to the contrary.

For the information of the thousands who are becoming interested in this discovery, we would remark here that the curative work is going along with increased success and volume. Interest therein is being constantly awakened in new minds and in new quarters. Several physicians are among those who have recently become interested, and three cases are now being watched by them, which have been subjected to microscopic examination, each of which is making rapid progress toward a successful issue—just as rapid as though the microscope had not been invoked to scare the practitioner off the track.

Persistent Opposition Still Maintained.

A petition was recently sent in to the Board of Supervisors asking the Board to request the City Board of Health to investigate this matter. The Board promptly and properly referred the matter to the Hospital Committee, the chairman of which promptly presented the request to the Board of Health; but the latter declined to take any action in the matter! And this notwithstanding the utter and acknowledged inability of the profession to handle the malady with any degree of success! A few more reports like that for the week ending July 25th, which told of the death of eight persons in this city in the week from cancer, will open the eyes of the people to the manner in which the lives of our citizens are being trifled with by the city officials to whom is entrusted all matters pertaining to public health. We have proven by the most indubitable evidence within the reach of a non-professional that cancer of the most decided and difficult character are constantly being cured in this city, many of which cases have come directly from the hands of our best physicians. The persons who have been cured are willing to go upon the stand and testify under oath to the correctness of what we have published. The doors to this treatment are open to all inquirers—professional or otherwise. The treatment will be shown and proven to be constitutional, harmless and without pain. All that is asked for is for physicians to go and see, and if we are imposing upon the public, let them expose us.

Four hundred people are suffering to-day in this city from cancer, which no regular physician pretends to be able to cure, and not one in twenty of which can obtain permanent relief from the knife or caustic. Nineteen out of twenty of those same people would be cured if the physician would advise them to seek relief in the proper quarter and in anything like an early stage of the malady. We are pleading the sense of humanity, and are not striving to advance any private interest. In so doing, we know we have the sympathy and encouragement of some of the best men and women in this city, besides a number of well-known physicians of all the schools. A Board of Health will soon be inaugurated that will do its duty without fear or favor. All we ask is a medical investigation. It is a simple and rea-

sonable request which sooner or later must come. An investigation will open the way for the world to reap the looked-for advantage. Every day that this madloal fraternity of this city delays this inquiry, means the loss of hundreds of valuable lives in this county alone. Is not the possibility of such a great good, which may be so easily determined, worth the effort?

W. B. E.

Koch is at work again on his tuberculin, and hopes to improve it during the next few months, after which he will publish his own report upon it.

A MAN inhales one pint of air at each breath. While standing, the adult respiration is 22 times per minute; while lying down, 13. To save your breath, lie down.

ABOUT 120 Harvard graduates have died since last year's commencement.

USEFUL INFORMATION.

ELECTRIC SAFETY APPARATUS FOR MINERS' CAVES.—At a recent meeting of the Federated Institution of Mining Engineers, London, England, a paper was read describing an electric safety apparatus for miners' caves. It was stated that although great advances had been made in recent years in nearly every branch of mining engineering we were no better off to-day for reliable safety cages than we were 20 years ago. During the past 10 years there had been an average of nearly 10 deaths per annum from the breakage of ropes and chains in shafts. The electrical apparatus in question consisted in the use of the hanging rope as a means of conveying electricity to four electro-magnets on the cage, each of the magnets sustaining a gripping cam. On the fracture of the rope and the consequent breaking of the electric circuit, the cams drop into guides.

AGAINST THE TRUSTS.—By a recent Act of the Illinois Legislature, any combination, contract, or agreement, the tendency of which is to place the management or control of any manufactured product in the hands of trustees, intending to limit or fix the price, or lessen the production or sale of any article of commerce, use, consumption, or manufacture, is made illegal and punishable. The Act is very comprehensive and sweeping in its scope, and if properly administered, will make an end of trusts in that State. The Jeweler's trust has already heeded the warning and dissolved. It is now in order for others to adopt the same tactics, or feel the power of the law. Trusts are at variance with legitimate and honorable business and ought to be wound up, so says an Eastern cotemporary.

THE INCUBATOR KNOWN TO THE EGYPTIANS. The artificial hatching of chickens is by most persons thought to be something new under the sun, and the result of the biological investigations and discoveries made by the evolutionists. The fact is, as Colonel General Cardwell, at Cairo, reports, the hatching of eggs by other than the natural process was known to the ancient Egyptians, and this process, handed down from father to son, leaves our scientific processes for the same purpose far in the rear. The extent of the usefulness among the Egyptians may be gathered from the Colonel General's statement that the even crop of marketable chickens is 15,000,000 each season.

WHY POPCORN WON'T POP.—The question is often asked why popcorn sometimes fails at the critical moment to pop. The trouble is that the corn has either been pulled too green or has become too dry, explains California Fruit Grower. In the former case the skin would be too tender to retain the heated air until the explosion took place, and in the latter case the skin is so brittle that the air escapes without bursting the kernel. If the corn is too dry, which is most frequently the trouble, immerse the unshelled ears half a minute in water and the grains will pop with a delightful exuberance.

IN MINERAL PRODUCTS this country takes first rank. The census shows the production of last year amounted to \$556,998,450, the greatest showing ever reported by any country. The industry gave employment to 512,114 persons, the annual wage amounting to \$12,409,809, the capital invested representing a total of \$1,173,000,000.

TO MAKE FUEL GAS.—Several of the South Side (Pittsburgh) glass companies have decided to put in coal gas producers instead of using solid fuel as they would otherwise be compelled to do next season, the supply of natural gas having been cut off. Among the firms making this move are Imhenn & Co., Phillips & Co., and Cunningham & Co.

A NOVEL INCUBATOR.—A Williamsport (Pa.) man used two pillows, between which he placed eggs, as an incubator, with good results. The pillows were placed in the garret, where they could get the heat of the sun, and 11 out of 12 eggs produced a duckling.

It may not be generally known, but it is a fact nevertheless, that ordinary rubber ink erasers remove rust from polished onlery without injury; try it and be convinced.

ELECTRICITY.

Effects of Electricity on Vegetation.

The application of electricity to agriculture has long been discussed and numerous experiments have been from time to time reported; but it is only within the last few years that these experiments have taken any practical shape.

Experiments by Prof. Lemetrom.

Very extensive experiments have been made by Prof. Selim Lemetrom of the University of Helsingfors. These experiments were continued for a series of years up to 1887, first in Finland, subsequently in France, to demonstrate that the electrical influence is the same whether in cold or warm latitudes. Some of his experiments, however, tended to show that they were seriously interfered with under a scorching sun. The professor's experiments were conducted both upon the potted plants in the hothouse and upon plants in the open field the insulated wires in the latter case being stretched upon poles over the plot of ground, and provided with a point for each square meter of area. The current was supplied by Holtz machines run from 8 to 18 hours daily, the positive pole being connected with the network of wires and the negative with a zinc plate buried in the ground. The electric influence was scarcely perceptible in the growing plants, but was very marked in the yield of many species, especially of barley and wheat, of which the crop was increased by half in some cases. In the hothouse the maturity of strawberries was greatly advanced. The results have shown that plants may be divided into two groups; one, the development of which is favored by electricity, comprising wheat, rye, barley, oats, red and white beets, parsnips, potatoes, celeriac, beans, raspberries, strawberries and leeks; and the other, whose development is more or less interfered with by electricity, including peas, carrots, kohlrabi, rutabagas, turnips, white cabbages and tobacco. The more fertile the soil, and consequently the more vigorous the vegetation, the greater was the excess of the crop under electric influence.

Experiments by N. Specnew.

N. Specnew has made some experiments which have been described as follows: In one series he used seeds of haricot beans and winter and spring rye. The seeds were soaked, electrified and immediately sown. The plants were more developed, their leaves were larger and their color brighter than those grown from non-electrified seed, but their yield was not affected.

In another series of experiments plates of copper and zinc about 2 feet by 2 feet 6 inches were buried at the ends of plots and connected by their upper faces, the effect being to establish a current through the earth. The result was manifested by a larger crop and by the growth of vegetables of enormous dimensions.

In the third series electrical collectors were mounted on insulated rods and connected by wires, the effect being to obtain a highly electrified atmosphere. Seeds of rye, corn, oats, barley, peas, clover, potatoes and flax were used. The form of electro-culture increased the yield of seed an average of one-half, and that of straw one-third, while the ripening was more rapid. It was also found that potatoes grown by electro-culture were rarely diseased, and the beneficial effects of electricity on vines attacked by phylloxera have already been observed. It is possible that a new means is at hand of combating the microscopic pests which attack vegetable growth.

Experiments in Russia.

M. Spehnoff, a Russian agriculturist, is reported to have made a trial of seeds which he electrified for two minutes by means of a current, and repeated the operation ten minutes upon peas, beans, rye, etc., and found that, generally, the electrification of seeds nearly doubled the rapidity of their growth. He then tried to electrify the earth. He took large plates of zinc and copper, 72 centimeters (28 inches) high and 45 (18 inches) wide, which were sunk deep into the ground at the extremity of flat iron bars, and joined them above the ground by an iron wire. The effect of this continuous current is stated to have been prodigious upon vegetables. A radish grew 44 centimeters (17.3 inches) in length, with a diameter of 14 centimeters (5½ inches), and a carrot 27 centimeters (10.6 inches) in diameter weighed three kilograms (6.6 pounds), nor did the excess in size detract from their good quality. The harvest was in all four times superior to the ordinary for roots, and two or three times for plants.

Tender, Succulent Vegetables.

One most important and generally acknowledged fact in growing vegetables is this: Give any vegetable its own time to grow to maturity, and it is invariably tough, stringy, bitter and unpalatable, not fit to eat. The whole aim of the gardener is then to hurry things up, as a quickly grown vegetable is tender, sweet, succulent and delicious, and the market value in direct proportion as these qualities predominate. It is the market value we are after, you know, nothing else. Grown quickly, there are no dead leaves to disfigure the appearance; the plant grows crisp, full of its natural flavor and commands the market and the best prices. A cabbage represents so much money, and money is very pretty. It may reasonably be inferred from these facts that

electricity would greatly aid in giving us tender, succulent vegetables.

Plants under Electric Light.

A beautiful illustration of the effect of electric light on plants was recently given by Dr. Siemens before the Royal Society of England, by placing a pot of budding tulips in the full brightness of the electric light in the meeting-room, and in about 40 minutes the buds had expanded into full bloom. Dr. Siemens stated that he had planted a number of quick-growing seeds, such as mustard, carrots, melons, etc., and having divided the pots into four groups, had one group kept entirely in the dark, one exposed to the influence of the electric light only, one to the influence of daylight only, and one to daylight and electric light in succession. He applied the electric light each evening from 5 to 11 o'clock and left the plants in darkness for the remainder of the night. According to his observations, the plants kept entirely in the dark soon died, those exposed to the electric light only, or to the daylight only, thrived about equally, and those exposed to both day and electric light thrived better than either.

An Interesting Lecture Experiment.

The following experiment was one frequently made in the lecture-room 30 and 40 years ago: Mix a good rich soil with black oxide of manganese in equal parts; moisten with warm water and press the soil inside a coil of insulated wire. Plant mustard seed in the soil and pass a current of electricity through it, using two or more large cells of bluestone (sulphate of copper) battery. As soon as the seeds sprout, the plant will set up a vigorous growth, blossom and produce seed within 36 hours. This is a very pretty experiment to show the wonderful activity which electricity will give to vegetation. The experiment is a very pretty one for school purposes where the class can watch the entire progress of the experiment. If the seeds should be soaked before planting before they commence to sprout, in water through which a current of electricity is caused to pass, the complete transformation from the ripened seed to its numerous progeny, fully developed, may be effected within 36 or 48 hours at the longest.

Salad While You Wait.

In connection with the above, we give, on the authority of a cotemporary, the following novel experiment, which has been devised for the entertainment of dinner parties, and which consists in the serving of salad grown under the eyes of the guests who partake of it. The secret of performing this magic feat lies in soaking good germinating lettuce seed in alcohol for about six hours, and sowing it in an equal mixture of unslaked lime and rich soil. After the soup has been served, sprinkle the seed with lukewarm water, and they will sprout immediately. The lettuce grows to about the size of hazel nuts before the time for serving the salad arrives.

OVERHEAD WIRES.—It will be remembered that some time ago the Board of Supervisors passed a resolution ordering Chief Engineer Scannell of the fire department to remove the overhead wires; and that in future all telegraph and telephone wires would have to be laid under the ground. Before the chief could proceed with his work, the Electric Improvement Company applied for and secured a temporary injunction restraining Scannell from carrying out the order of the Supervisors, and also against the city from proceeding with the work. Suit was brought to enjoin the injunction and both the defendants demurred. The court on Monday enjoined the demurrer and dismissed the case. In future, wires will have to be placed underground in this city.

FREIGHT ON ORE.—S. P. Blade of Dagget, San Bernardino Co., writes as follows: "Your editorial on Freight on Ore is good. The idea should be carried out so that ore can be benefited in San Francisco as cheaply as in Pueblo. Freight rates should not be above one cent per ton per mile on 60-ounce ore. Down here everything should be booming instead of idle. There are plenty of gold, silver and lead mines, but capital is slow to take hold of even developed ones. The English are far ahead of our own people in this, as when they see a good property they are ready to pay what it is worth and work it."

WHY IT TURNED BLACK.—Some new belting was kept running for only four hours at Owens College during the late weather. It was new and bright when started; when stopped it was black and loaded with dirt. It had been running at 4000 feet an hour. Professor Reynolds points out the analogy to the dirtiness of an express train, the phenomenon in both cases being due to the fact that the rapidly moving body comes in contact with a greater quantity of air in a given time than a stationary body, and therefore picks up a greater quantity of atmospheric pollution.—*Mechanical World.*

ONE of the longest and most costly steel railroad bridges in the country is now being erected by the Union Pacific across the Columbia river at Vancouver, Wash. The length from the Washington to the Oregon shore will be 6000 feet, and the draw pier will be over 400 feet long. The cost of the structure will be over \$4,000,000.



A. T. DEWEY. W. B. EWER.
DEWEY & CO., Publishers.

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W. B. EWER, SENIOR EDITOR

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A. T. DEWEY. W. B. EWER. G. H. STRONG.

SAN FRANCISCO:

Saturday, August 8, 1891.

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Passing Events.

The Pine Nut mining excitement in Nevada still continues, and many miners are on the ground. Little active work has yet been done, so no one can tell much of the permanency of the veins. Many prospectors are, however, investigating the region.

The big antimony mine at Big Creek near Austin, Nev., has obtained rates from the railroad so that it now ships its ore for reduction in this city. The ore is low grade and will not bear high freight rates.

The marble quarry near Columbia, Tuolumne county, has passed into the hands of English capitalists, who will properly open it. The English and French capitalists are showing more faith in our mining industry in this State, than are our own people.

The record-breaking feat of the steamship Majestic this week is a notable one for marine engineers, the steady, regular, high speed being due to the perfect working of the splendid machinery with which the vessel is fitted.

The Idaho Mining Company of Grass Valley has declared its 256th dividend, at the rate of \$3 per share. The aggregate of the dividend is \$9300.

No Government Bonus.

There are many persons who believe that the U. S. Government stands ready to pay a bonus of \$20,000 or \$25,000 to the discoverer of a tin mine in this country. There are many more who believe that the Government will pay \$100,000 to the inventor of a perpetual motion machine.

Both these ideas are fallacious. No bonus has been offered in either instance, nor is there likely to be. As for tin, there is one tin mine in operation in this State, turning out marketable tin. In South Dakota, one company alone owns 1100 tin-ore claims, more or less developed. Had there been a bonus offered, it would have been collected long ago.

Now, in the case of perpetual motion machines, the Government actually discourages inventors instead of encouraging them. The U. S. Patent Office was formerly bothered constantly by applications for patents on impracticable inventions in this line. The examiners were given great trouble and the inventors themselves were led to expend both time and money on pieces of absolutely worthless mechanism.

The inventors were of course acting in good faith as far as they were concerned, but in most cases they were ignorant of the principles and inexperienced in the details of mechanism, producing machines sometimes of marvelous complication, but of no practical utility. It was a deed of charity to this class of men to prevent them expending their money and that of their credulous friends. It is very rarely that any one skilled in machinery attempts to design anything in the line of "perpetual motion," the inventions in this direction coming mainly from men in other walks of life.

Some time since, the Patent Office adopted a rule which has had the effect of discouraging the production of perpetual-motion machines. When an application for a patent on one of these is received, a circular is sent to the inventor informing him that no examination of his patent papers will be made until he forwards a working model of the invention. This ends it, of course, as none of them have any working model. They have only crude drawings. When they make a model, and it is found not to work, it is not forwarded. So it will be seen that the U. S. Government is not so anxious to have a perpetual-motion machine as to offer any bonus for it.

Metallurgy of Gold.

The "Metallurgy of Gold" by M. Eisler, formerly of this city, is a practical treatise on the metallurgical treatment of gold-bearing ores, including processes of concentration and chlorination and the assaying, melting and refining of gold. This edition contains 187 illustrations in its 524 pages. The treatment of gold-bearing ores, although at one time so uncertain in its results as to be not only a hazardous, but almost a purely speculative, business, has now, through continued improvements in appliances and the adoption of more economical methods, developed into a settled industry, in which more or less profitable results are obtained even from comparatively low-grade ores. An idea of the scope of this book will be gained from the titles of the principal chapters. After the introductory one, mainly relating to the gold-mining in California, hydraulic mining, etc., the next two chapters are on crushing and amalgamation.

Then follow chapters on milling machines, concentration, rebellious ores, roasting of pyritic ores, hydro-metallurgy of auriferous ores, chlorination, electro-metallurgy, smelting of pyritic ores, cupelling, parting and refining of gold bullion, melting and assaying of gold, chemical examination of gold ores, geological features of gold-producing countries, etc.

The work is quite comprehensive and a useful one. It is written from an English standpoint, so to speak, but California practice is constantly quoted, most of the machines figured are also those in use in this State. From the nature of the work, it is one largely of compilation, but the author has contrived to get almost every thing of interest. The book is published by Crosby, Lockwood & Son, 7 Stationers Hall Court, Ludgate Hill, London. We can supply the book, to those who may order it, for \$3.50 per copy.

The Gold Belt of California.

Dr. G. F. Becker, geologist in charge of the California party of the U. S. Geological Survey, has been on a tour of inspection among the three surveying parties now at work in the field. As stated elsewhere in this issue, the work is mainly on the gold belt of California, as it has been for several years. The investigations are being conducted from the crest of the Sierras down to the great valley, from the Yosemite to Quincy, Plumas county, embracing an area of some 16,000 square miles between parallels 37½ and 40. One party has been in Plumas and Butte counties, one in Nevada county, and one in Amador. Topographical and geological maps of the auriferous gravels of the State are being prepared, which will be published with the results of the investigations as to conditions under which miners may expect to find gold gravel. It will take two more seasons to complete the work in the region referred to, and then work will be commenced in the southern part of the State. Seven sheets of the map above alluded to will be ready for the printer by the end of this year.

Among other things, Dr. Becker says: "We have made no extraordinary discoveries, but I have satisfied myself that the gold-bearing mines of California have not begun to be exhausted. There are very many profitable quartz mines in the State, and I hardly need to say there are innumerable gravel mines which could produce all the way from \$5000 to \$500,000 annually, and the owners of which are debarred from operating them by hydraulic mining. In Butte county alone I found 250 hydraulic mines, to prevent whose operation, injunctions had been served on the owners. To this may be ascribed the so-called decadence of gold-mining in California."

As these injunctions referred to are from United States courts, and the Government has practically stopped gravel mining on the hydraulic system, it seems odd for the same Government to be conducting surveys and making maps of the auriferous gravel deposits, and getting ready to tell miners how to find them. The miners would really prefer to be told some way to work the gravel they have, than be told where and how to find new deposits which they cannot work when found. But then one branch of the Government seldom knows what another is doing. The Geological Survey is going ahead with its work among the auriferous gravels and ignoring the fact that the best system of working them is tabooed by the courts. The survey people probably recognize the fact that the better judgment of future generations, free from prejudice, will find some way by which these deposits of gold can be utilized to a profit. When that time comes, then work among the gravels will have practical results and be valuable to the mining community. As to the cause of the decadence of gold mining in California, Dr. Becker states a now recognized fact.

Marine Engines.

The record of speed across the Atlantic has again been broken, this time by the White Star steamship Majestic, which has made the trip from Queenstown to Sandy Hook in 5 days, 18 hours and 8 minutes. The best previous record was that of the City of Paris in 5 days, 19 hours and 18 minutes in the year 1889. The highest run was 501 miles in 24 hours. The Inman liner City of Paris, in her August voyage, 1889, traveled 2788 miles in 8358 minutes. The Majestic traveled 2777 miles in 8288 minutes. In point of time, the Majestic is 70 minutes ahead. In average speed, the City of Paris traveled the nautical mile in 2.998 minutes, while the Majestic covered the mile in 2.948 minutes. She was .9 of a second faster. The Majestic averaged 20.104 knots an hour.

One feature of the passage of the City of Paris is still unequalled. On August 25, 1889, she covered 502 knots, on August 26th 506 knots, on August 27th 509 knots. This is the Majestic's seventh passage. When she first came she was beaten by the City of New York. Chief Engineer Sewell, in speaking of his engines, said that they could be made to do a little better yet. They had developed 19,500 horse power, giving the wheels an average of 78 revolutions a minute, with a consumption of 220 tons of coal a day—a marvelously small amount of coal. He said the

engines were good for 20,000 horse power. On the first day of the recent trip he remarked that the engines were working as smoothly as the wheels of a chronometer.

The progress in marine engineering of late years has been remarkable, and has been steady. The marine engine of to-day is about the perfection of giant mechanism. The enormous bulk of the hulls they drive at such great speed makes their operation still more wonderful. These big steamers now run steadily over 20 knots an hour. On smaller vessels still greater speed is attained, some of Herreshoff's models, equipped with his boilers and engines, having run as high as 26 and 27 knots. This skilled designer predicts a speed of 35 miles an hour in steam vessels in a few years.

Mineral and Agricultural Lands.

Acting Secretary Chandler has rendered a decision in the case of Harlish against Wallace on appeal from the finding of the local land officers at Sacramento, Cal., which will materially change the practice of the Department as to agricultural entries which are subsequently found to be mineral in character. The acting Secretary holds that, in order to defeat agricultural entry on the ground of mineral character of land, it must be shown that the mineral was known to exist at the time of entry. Heretofore the practice has been to cancel agricultural entries where mineral was discovered at any time prior to issuance of patent.

This seems to be one more link in the chain which is drawn across the way to prevent the miners proving lands are in the mineral domain instead of the agricultural. It is becoming easier and easier to get at mineral lands for so-called agricultural purposes. As has been repeatedly stated, the agricultural claimant, presumably ignorant of the mineral character of land, has only to swear that he knows of no mineral. Several others equally ignorant swear the same. Then, when publication comes, some mining man says the land is mineral in character, and if he can prove it, the agricultural claimant is thrown out.

But under this ruling, being able to prove it before patent issues, will not do; he must prove that he knew of mineral before the entry was made. The agricultural claimants' knowledge is negative, and the mineral man cannot be positive without examination; and the examination avails nothing if the entry has been made, as it attracted no attention until the entry was made, the agricultural man has the best of it.

It is under just this kind of conditions that the domain open to the prospector is becoming gradually narrowed. The law never contemplated such a state of affairs. It wanted agriculturists to pay for agricultural land and miners to pay for mineral land. The prices are on a different basis; but when an agriculturist gets hold of a lot of land containing minerals, and patents it, the minerals belong to him as well as the land.

Up in Shasta county and throughout the miners have had to hand together and go about proving the mineral character of large tracts, to prevent the land being taken up by agriculturists. In other parts of the State, where the miners have no direct counter interest, parcels of mineral land are constantly being taken up by agricultural claimants. This is being systematically done in many counties, and the rulings of the department seem to favor instead of prevent the custom. This last ruling seems to us to be a very bad one indeed. The miners ought to be allowed to prove mineral character at any time before patent issues. If the Government really wanted the facts in such case, it would be very easy to get them. The new practice is bad for the mining industry and an aid to fraudulent entries.

The Standard Consolidated Mining Company has received a hullion shipment valued at \$23,327.24, being the product of the mine for the month of July. The company has about 60 men on its pay-roll, and is doing much work in the mine, which is looking well. Last week 321 tons of ore were crushed at the mill. The average battery assay was \$16.66 per ton.

WELLS, FARGO & Co. are about to give up their banking department in Virginia City, and in future do nothing but an express business.

Gas-Fired Furnaces.

Wrought-iron is produced in Germany by puddling exclusively, and almost invariably, by that variety of the puddling process which

position has been reached, when they are lowered into place, and the connection is again complete. The Pietzka furnace at Zawadzky, holding a charge of 500 kilos, produced by direct firing, 6280 kilos; by gas-firing, 6674 kilos

This record is especially favorable, since, deducting the amount of coal burned for the steam-power required in the operation of the furnace, it shows 28 to 29 kilos of coal used in puddling proper, while if all the gas were used

Locating Claims and Assaying Ores.

EDITORS PRESS:—Will you kindly answer me the following questions if possible, as no one here can: (1) Five men locate four claims and write out one notice claiming 6000 feet. They survey and record the same as partners on one notice and name it the 'Juniper Point.' Can we hold the claims that way, or will we have to record separately each claim? (2) Can you tell me where I can get a copy of 'The Explorers, Miners and Metallurgists' Companion,' by J. S. Phillips, M. E., and what is the price? (3) Do you assay ores; if so, what are your terms for assaying for what is in the rock? (4) Does the U. S. Mint of Philadelphia, Pa., do assaying? (5) What is the Government bonus for finding a good tin mine, and to whom do you apply to get it? J. H. L. Paisley, Luke Co., Or.

(1.) It is impossible for any man or set of men to locate and hold by one original location, 6000 feet of ground. It would be contrary to law. The law expressly says: "A mining claim located after the 10th day of May 1872, whether located by one or more persons, may equal, but shall not exceed, 1500 feet in length along the lode."

The Land Office Regulations on the subject, are as follows: "From and after the 10th of May 1872, any person who is a citizen of the United States, or who has declared his intention to become a citizen, may locate, record, and hold a mining claim of 1500 linear feet along the course of any mineral vein or lode subject to location; or an association of persons severally qualified as above, may make a joint location of such claim of 1500 feet, but in no event can a location of a vein or lode made subsequent to May 10th, 1872, exceed 1500 feet along the course thereof, whatever may be the number of persons composing the association."

The language of both the law and the regulations is plain and explicit on the point in question, and no such location as that stated would stand in law. It would be impossible to obtain a patent on the claim under the circumstances, as the law recognizes no location of over 1500 feet. Of course four men could each locate a separate 1500 feet, and record separate claims, and afterward the claims might be consolidated, but the original locations, record, etc., would have to be separate for each 1500 feet, to be legal. The language of the law is so plain in this matter that there can be no mistaking it.

(2.) J. S. Phillips, the author of the "Explorers' Miners' and Metallurgists' Companion," died some years ago. His book is for sale at this office; price, post paid, \$6.

(3.) No, we do not assay ores, leaving that to those who make a special business of it. In our advertising columns will be found the names of men competent to do any work of that kind.

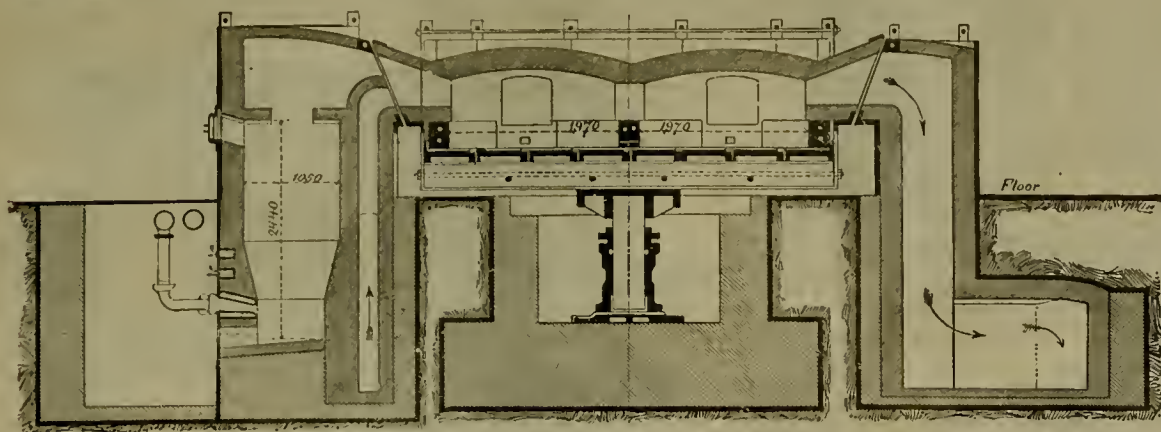
(4.) The U. S. Mint at Philadelphia and the branch Mint here make bullion assays, but neither is in the business of making ore assays for private individuals. The ore assay is what the miner usually wants, and the assaying firms make these. The miner has no need of a bullion assay, while he gets bullion from his ore.

(5.) You apply to no one for the Government bonus for a good tin mine for the simple reason that the Government does not offer a bonus for a tin mine, and never did. And even if it did, the bonus would have been long since collected. This subject is referred to more at length in another article in this issue of the Press.

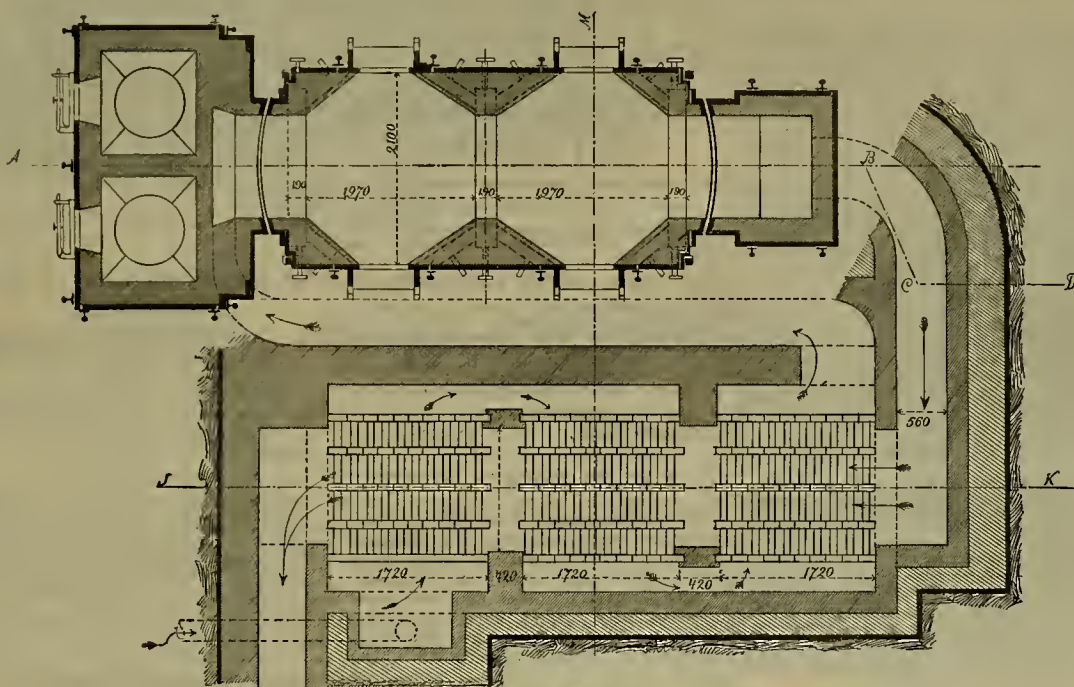
W. R. ECKART, Consulting Engineer of the Comstock Pumping Association, says that the prospects for the drainage of the lower levels of the Gold Hill mines continue favorable. Just now progress is slow. Mr. Eckart says that he had a conversation with John W. Mackay shortly before that gentleman's departure for the Comstock, in which Mr. Mackay said he was greatly interested in the drainage proposition, and that he would investigate it while upon the lode, with a view to resuming pumping at other points, if he thought it feasible.

The antimony mine on Big creek, south of Austin, Nev., will in future ship ore to Starr & Matheson in this city, instead of to Swansea, Wales, arrangements having been made for better ore rates. This deposit is a very extensive one, but at present low prices, they do not employ many men.

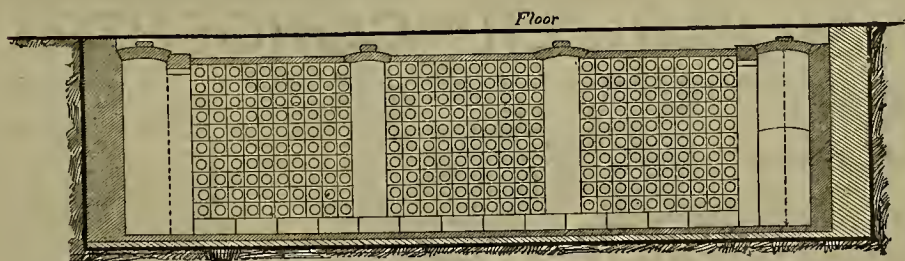
A New wave-power motor is being put up at Point Lohoa to pump water to a height where its fall may be utilized to generate electricity.



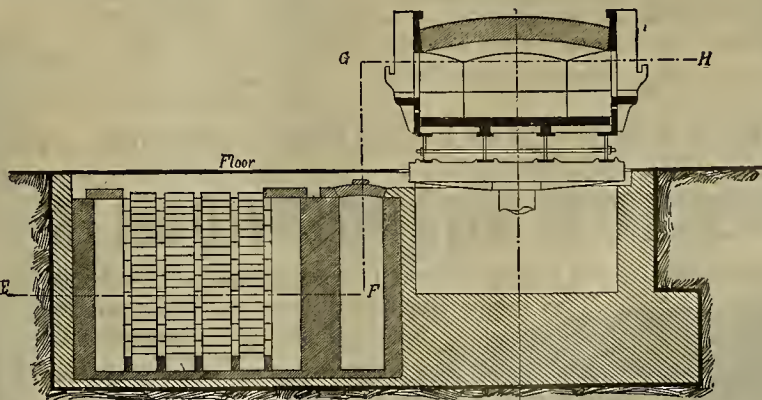
PIETZKA PUDDLING-FURNACE—LONGITUDINAL SECTION ON A B D.



PIETZKA FURNACE—HORIZONTAL SECTION ON E F, G H.



PIETZKA FURNACE—LONGITUDINAL SECTION ON J K.



PIETZKA FURNACE—CROSS-SECTION ON L M.

depends upon the air for oxidation. The other variety, in which oxidation is effected by means of a fetling of ore, and which is so common in America, finds in Germany a very subordinate application only. The essential improvements in puddling have been mainly in the more complete utilization of fuel by means of gas-firing and double furnaces. One of the two furnace designs specially mentioned in this connection by Dr. Herman Wedding (before the American Institute of Mining Engineers) is the Pietzka furnace, with constant direction of flame and reversible hearth. The latest form of this, as seen at Zawadzky, in Upper Silesia, is shown in the cuts.

There the flame maintains one direction, yet the hottest flame always strikes the hearth in which puddling is going on. The peculiarity of this construction is that both hearths are carried on a hydraulic piston which stands underneath between them. The connections between the side-walls and fixed fire chamber or flue are made with inclined conical surfaces.

The hydraulic piston lifts the hearths a little before turning them; and hence they turn freely and without friction until the reversed

of muck-bar, as the average per shift—in single weeks, however—an average of 10,000 kilos of muck-bar, with a coal consumption per 100, of 66 kilos, with direct firing, and 42 kilos, with gas firing. The escaping gases were here utilized further in the production of steam.

to heat the generators, this figure would be further reduced to 20 to 25 kilos.

A TOTAL of \$200,650 was disbursed in wages to employees of the Comstock mines and mills for the month of July.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

ARIZONA MINES.		
	Dr.	Cr.
Crocker		\$2,090 17
Locomotive		763 23
Peer		4,4 6 72
Peerless		3,373 01
Silver King	\$3,531 63	
Weldon	331 12	
BODIE MINES—CALIFORNIA.		
Bodie		9,114 59
Bulwer		11,678 28
Monro		3,753 52
Standard		18,084 11
Syndicate		2,867 36
TUCACORA MINES—NEVADA.		
Belle Isle		397 42
Commonwealth	6,743 57	
Del Monte	8,272 47	
Diana		365 56
Grand Prize	2,401 15	
Independence		1,147 40
Navajo	7,367 85	
Nevada Queen	12,373 72	
North Belle Isle	27,201 25	
North Commonwealth		449 25
COMETOCK MINES—NEVADA.		
Alpha Con.	15,175 32	
Alta	3,815 19	
Aodes	23,234 62	
Belcher	13,392 75	
Best & Belcher	27,465 78	
Bullion	13,499 25	
Caledonia	14,231 20	
Challenge Con.	11,177 11	
Chollar	55,457 93	
Confidence	4,795 92	
Con. Cal. & Virginia	212,268 75	
Con. Imperial	10,813 11	
Con. New York	8,241 68	
Crown Point	24,460 40	
East Sierra Nevada	2,025 20	
Exchequer	1,947 71	
Gould & Curry	7,532 63	
Hale & Norcross	25,755 09	
Julia Con.	714 85	
Justice	16,339 22	
Kentuck	8,990 16	
Lady Washington	14,494 31	
Mexican	4,793 46	
Occidental	12,697 24	
Ophir	18,433 22	
Overman	7,010 70	
Potosi	53,622 77	
Savage	45,295 43	
Seg. Belcher & Mides	7,554 31	
Scorpion	5,393 99	
Sierra Nevada	23,525 32	
Silver Hill	14,942 34	
Union Con.	6,655 73	
Utah	9,820 74	
MISCELLANEOUS MINES.		
Eureka Con.	37,401 86	
Holmes	51,728 34	
Mount Diablo	576 67	

NOTE.—Holmes has unsold bullion amounting to \$851 ounces; Con. Cal. and Va., \$35,663.16 coin in Virginia City, and unsold bullion, \$37,857.43, and further shipments to arrive; Navajo has \$12,800 due on pumping account.

TRAVEL COMFORTABLY.
FOR COMFORT take the Union Pacific Railway. THROUGH PULLMAN PALACE SLEEPING CARS, San Francisco to Chicago WITHOUT CHANGE, with DINING CARS the ENTIRE DISTANCE. Tourist excursions leave every Tuesday and Saturday, with through Pullman Tourist Sleeping Cars to Chicago, without change. Reclining Chair Cars are also run on excursion trains. Passengers going via the Union Pacific Railway arrive in Chicago 22 HOURS IN ADVANCE of all trans-Continental lines. D. W. HITCHCOCK, General Agent, No. 1 Montgomery St., San Francisco.

Copied from the Morning Call.

Editor Morning Call.—DEAR SIR: In the interest of suffering humanity, and trusting that a knowledge of my wonderful cure may be of benefit to the public, I address you. About four years ago, while suffering with neuralgia, my eye became inflamed and had to be removed. A cataract began to form on my right eye about the same period. I consulted Dr. Farrar and other eminent oculists, and they all informed me that they could do nothing to relieve me, alleging as the cause that the cataract was not ripe, and could not be operated on until I went totally blind.

On the 5th of January last, being almost totally blind, some friends of mine recommended me to try Dr. Robert J. La Grange, the eye, ear and throat specialist of 215 Powell street, this city. At last I was prevailed upon, and I consulted the doctor, although I was skeptical at first as to his treatment from the consultations I had held with other surgeons. I was totally blind, however, and felt that if his treatment would do no good it could do no harm. Inside a week my daughter remarked how wide I could open my eyelids, which had become paralyzed. Under his treatment the muscles had been strengthened. The treatment is very simple and absolutely painless. No cutting and no operations; simply using a salve on the eyelid and leaving it on a short time each day, and then bathing in warm water. The salve has the effect to scatter and disperse the cataract, and thus the vision is gradually restored. The doctor scouted the idea of waiting until you became blind, and says the sooner the treatment is started the easier it will be to remove the evil. I began to improve at once and each day found myself some better until now I can see well, and the doctor expects that in a few months more my sight will be completely restored. In justice to the doctor and to those that are afflicted, I feel it my duty to let the public know of this great boon and the man to whom I am indebted for my restoration to sight. Had I taken the remedy at once I would have been cured in a very short time, instead of waiting and losing nearly four years of valuable time going blind. In the course of a conversation with Mr. Boyd of Front street, whose eye had been operated on under the old method, we both made test of our eyes and my sight was better than his, and while under the old method his will never be any better than at the present, mine is daily improving. Thanking you for your valuable space, I am yours, etc., WALTER W. MOSES, 35 Perry street, San Francisco.

NOTE.—As the system of treatment mentioned above is entirely new and of recent discovery by Dr. La Grange this letter is of vital importance to the public. Mr. Moses is a member of several fraternal societies in this city, the members of which are aware of the condition of his sight before he began treating with Dr. La Grange and his improved state at the present time.

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Under the heading of the first chapter, "Testing Ores for Silver," are found paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride of ammonia, Fatchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titide Smelting, Mexican process, Chilean process, Kroeckhke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, greens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Nolce's pulverizer, a cheap rock breaker, etc.

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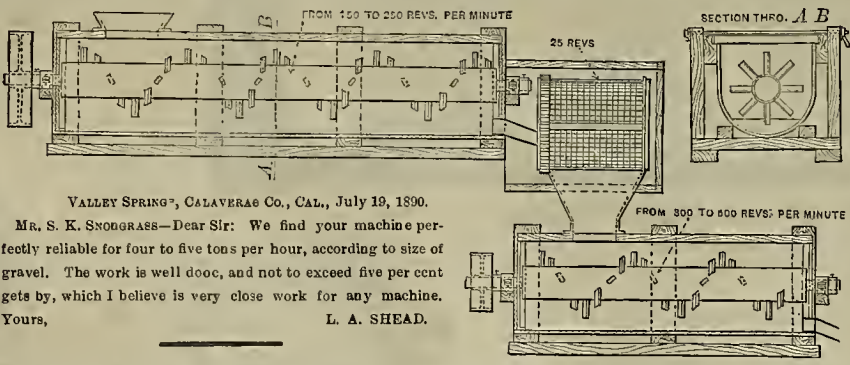
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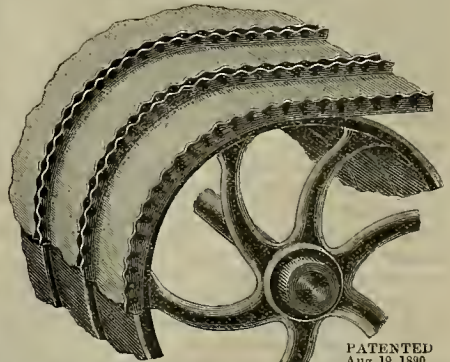
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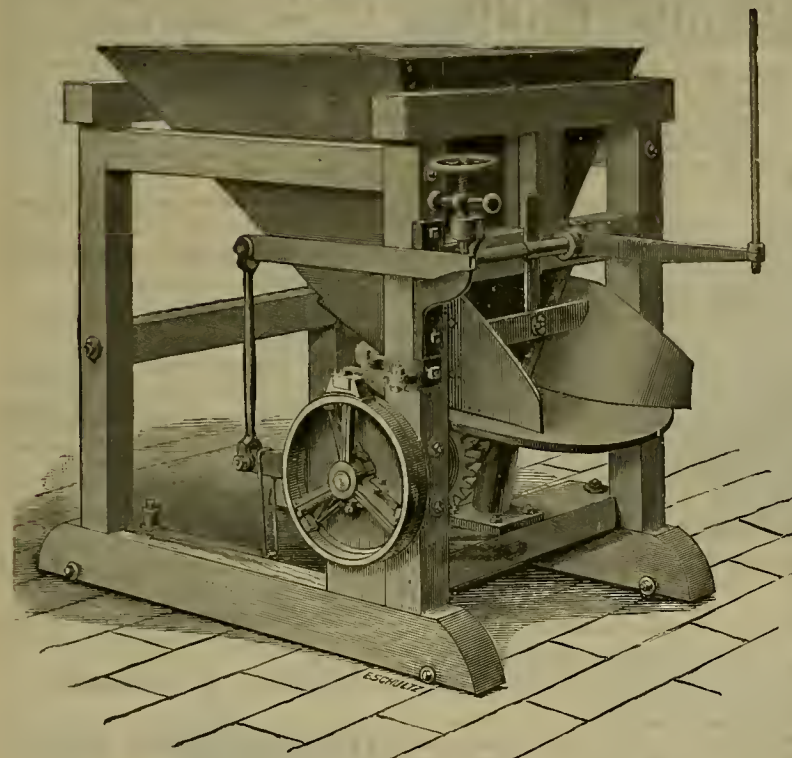


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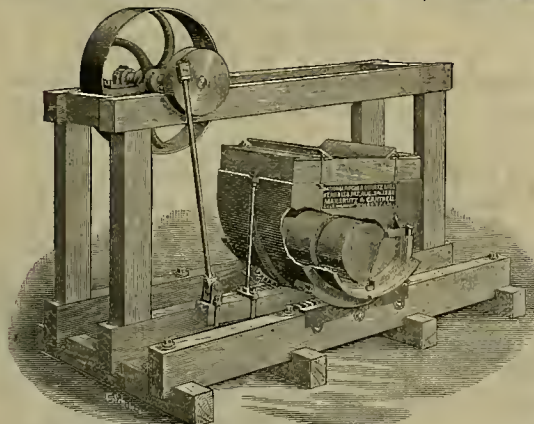
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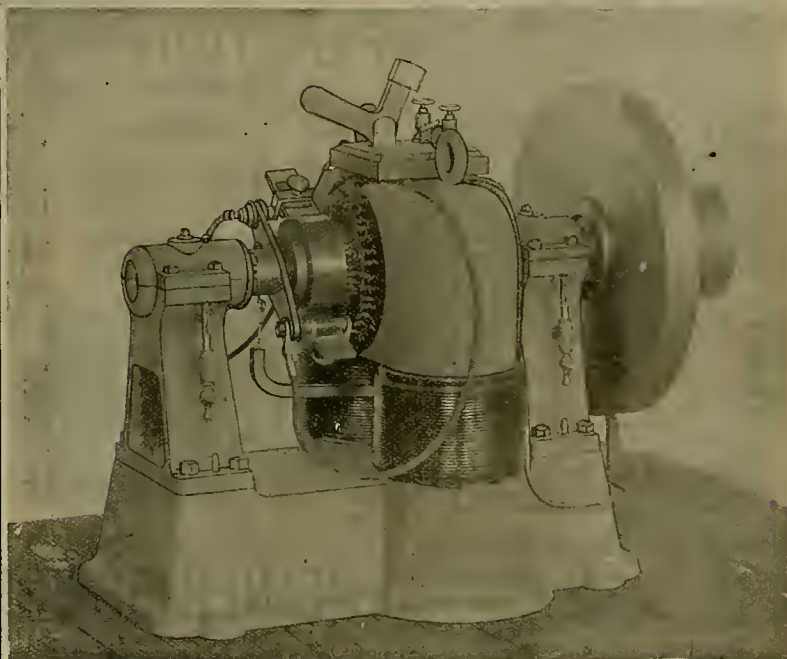
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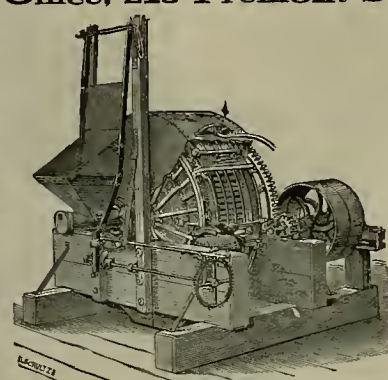
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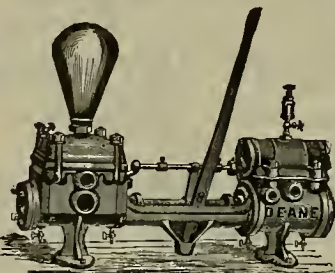
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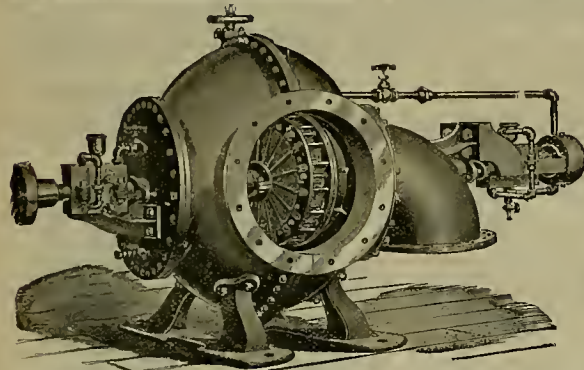
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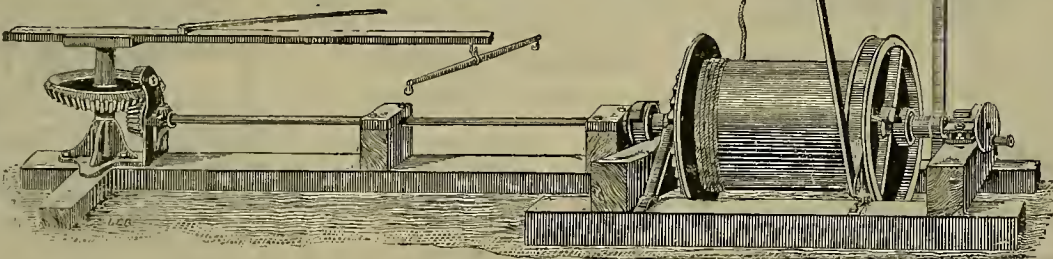
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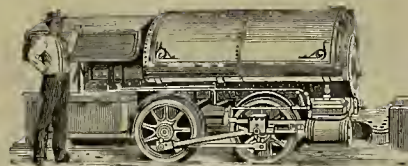


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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 6, 1891

General trade shows signs of improving, with the buying apparently of an assortment character. Iron workers are generally busy, with orders in several cases well ahead. The season so far has been favorable to them owing to the lower cost of fuel and iron. The money market is very easy, considering the very heavy crops that are being marketed.

QUICKSILVER—Receipts the past week aggregate 273 flasks. The lessening output of the Almaden mine is having a more favorable influence on the market, which might soon to bring about better prices.

MEXICAN DOLLARS—Under continued light demands, the market does not show any appreciation in prices—last week's quotations holding good for this week's issue.

SILVER—In London higher prices were reached the past week than at any time since the high figures reached last year. In New York, market prices have hung around \$1.00. It is the prevailing opinion that the Government's purchases for this month will be made at an earlier date than they were in the preceding month. All advices received from the East point to a certainty that one of the first acts of the 52d Congress will be to pass a free-coinage bill, and it is given out semi-officially that President Harrison will sign a bill of this character. This, if true, is a long step in the right direction, and which when taken, will take out of politics the cry for more circulating currency. The writer is inclined to believe that the President will sign a free-coinage bill, even if not in accord personally with such a measure, in deference to the wishes of a vast majority of the people of the United States. With this country returned to bimetalism, there can be no question but European Governments will soon be forced into line.

LIME—Receipts the past week aggregate 3821 bbls. There is a continued free movement both for home and for Hawaii.

BORAX—Receipts the past week aggregate 230 cts. The market is reported essentially unchanged.

LEAD—A higher range of prices coming through from New York indicate that smaller holders have sold out, and that buyers' necessities compel them to pay large holders' advanced views. The consumption is said to be enlarging.

TIN—The market is quiet but firm for plate. In pig trading is light, with supplies on spot and to arrive reported to be in excess of the demand. Foreign advices report pig lower and weak at the decline.

COPPER—The market continues to ease off. It now looks as if lower prices may be reached, before any degree of stability manifests itself, than at any time since the disastrous French syndicate deal, yet this appearance may be fictitious, made so as to allow the concentration by a pool or syndicate of all available supplies for another deal. This opinion is strengthened by advices from England, reporting that all offerings are being absorbed at the declining prices.

IRON—Liberal spot supplies and heavy near by deliveries have had their natural effect, and under some cutting the market is lower. At the lower prices larger quantities will go into consumption.

COKE—The market is weak with concessions reported obtainable.

COAL—Receipts the past week aggregate as follows: Nantam, 1083 tons; Sydney, 1500; Departure Bay, 1500; Coos Bay, 700; Comox, 4700. Total, 9443 tons. Light receipts and a steadily increasing consumptive demand create a stronger market. Capt. Wilson, a large and prominent dealer claims that everything now points to a higher range of prices before the close of the present month. Australian advices report more vessels up for this port and after about a fortnight's time ships are again clearing with cargoes.

Coal and Coke.

SPOT FROM YARD—PER TON.	TO LOAD—PER TON.
Wellington.....\$ 9 00	Australian.....\$ 7 25 @
Greta.....12 30	Liverpool Stm.....7 00 @
Carbon Hill.....8 00	Scotch Splint.....7 00 @
Nantam.....9 00	Cardiff.....7 25 @
Gilman.....7 00	Lehigh Lump.....14 00 @
Seattle.....8 00	Cumberland bk.....12 00 @
Coos Bay.....0 00	Egg, hard.....12 00 @
Cannel.....9 50	West Hartley.....7 00 @
Egg, hard.....14 00	
Cumberland, in sacks 14 00	
do, bulk.....13 00	
Wallend.....9 00	
Scotch Splint.....8 00	
Brymbo.....8 50	To load.....\$12 00 @ 13 00
West Hartley.....8 00	Spot, in bulk.....14 00 @

Coke—English.

Eastern Metal Markets.

By Telegraph.

New York, August 6.—The following are the closing prices the past week:

Silver in	Silver in	Copper.	Lead.	Tin.
London.	New York.			
Thursday.....45 15	1004	12 30	4 37 1/2	20 30
Friday.....46	100	12 25	4 37 1/2	20 30
Saturday.....46 1-16	1003	12 25	4 35	20 20
Sunday.....46 1-16	1003	12 15	4 35	20 15
Tuesday.....46 1/2	1004	12 15	4 40	20 00
Wednesday.....45 3/4	1001	12 00	4 35	20 00

Quicksilver is steadier. Borax is in fair demand at firm prices. Tin is weak and lower. Lead is tending up under a good demand and strong holding. Copper continues to shade off under free offerings and an offish demand.

Complimentary Samples.

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COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ'T AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co., Nevada.....	42.....50c.....Aug 4, Sept 7, Sept 28.....	O L Perkins.....	331 Pine St
Best & Belcher M Co., Nevada.....	49.....50c.....June 23, Aug 28, Aug 18.....	L Osborn.....	309 Montgomery St
Bullion M Co., Nevada.....	30.....50c.....July 18, Aug 24, Sept 8.....	E B Grayson.....	331 Pine St
Chollar M Co., Nevada.....	30.....50c.....July 14, Aug 18, Sept 8.....	E Elliott.....	309 Montgomery St
Challenge Cons M Co., Nevada.....	9.....50c.....July 31, Sept 2, Sept 23.....	C L McCoy.....	331 Pine St
Clara Cons M Co., S Dakota.....	4.....25c.....June 2, July 20, Aug 15.....	A Cheminant.....	323 Montgomery St
Crown Point M Co., Nevada.....	55.....50c.....July 9, Aug 13, Sept 3.....	J Newlands.....	331 Pine St
Cruikshank M Co., California.....	2.....50c.....July 12, Aug 12, Sept 12.....	J W Newlands.....	211 Sansome St
Evening Star M Co., California.....	2.....1c.....June 25, July 30, Aug 20.....	J J Scoville.....	320 Sansome St
Exchequer M Co., Nevada.....	31.....25c.....July 21, Aug 27, Sept 17.....	C E Elliott.....	339 Montgomery St
Golden Fleece Gravel M Co., Cal.....	15.....45c.....June 30, Aug 12, Sept 17.....	W J Gleason.....	Phelan Block
Golden Jacket M Co., Nevada.....	4.....5c.....July 14, Sept 12, Sept 17.....	R C McClellan.....	331 Montgomery St
Gould & Curry M Co., Nevada.....	47.....30c.....July 22, Aug 25, Sept 17.....	A K Burdrow.....	309 Montgomery St
Justice M Co., Nevada.....	48.....25c.....July 11, Aug 15, Sept 14.....	E E Kelley.....	419 California St
Martin White M Co., Nevada.....	26.....25c.....July 21, Aug 14, Sept 21.....	A B Cooper.....	325 Montgomery St
Mineer King M Co., Arizona.....	3.....10c.....June 24, Aug 11, Aug 25.....	J Norman.....	419 California St
New El Dorado M Co., California.....	2.....5c.....Aug 4, Sept 19, Oct 7.....	J W Pew.....	310 Pine St
Northwestern L & M Co., Br Columbia.....	3.....8c.....July 18, July 31, Aug 24.....	P Bonaccina.....	433 California St
Potosi M Co., Nevada.....	36.....50c.....July 21, Aug 25, Sept 15.....	C E Elliott.....	309 Montgomery St
Saratoga M Co., Nevada.....	1.....5c.....June 20, July 24, Aug 12.....	W K Drake.....	119 California St
Savage M Co., Nevada.....	76.....50c.....July 18, Aug 12, Sept 7.....	C Herman.....	309 Montgomery St
Scott Bar M Co., California.....	4.....25c.....July 20, Aug 29, Sept 21.....	H Pink.....	309 Montgomery St
Seg Belcher & Miles Cons M Co., Nev.....	8.....25c.....June 16, July 20, Aug 10.....	E H Holmes.....	309 Montgomery St
Smith M Co., California.....	2.....8c.....June 27, Aug 14, Sept 18.....	C E Wiggin.....	19 O'Farrell St
Tetrahoff Cons M Co., California.....	6.....1c.....July 11, Aug 11, Aug 15.....	W J Burnett.....	303 Pine St
Tuolumne M Co., California.....	7.....50c.....July 10, Aug 12, Sept 12.....	C Herman.....	309 Montgomery St
Valley View M Co., California.....	3.....5c.....June 16, July 30, Aug 12.....	W J Burnett.....	303 Pine St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alta M Co., Nevada.....	L Osborn.....	309 Montgomery St.....	Annual.....	Aug 30
E Sierra Nevada M Co., Nevada.....	G B Spinyer.....	310 Pine St.....	Annual.....	Aug 10
Humboldt M Co., Nevada.....	J C Ruddock.....	35 New Montgomery St.....	Annual.....	Aug 24
Julia Cons M Co., Nevada.....	J Stadler.....	309 Montgomery St.....	Annual.....	Aug 16
Mineral King M Co., Arizona.....	J F Norman.....	419 California St.....	Annual.....	Aug 15
Monte Christo M Co., Nevada.....	L Leavitt.....	333 Kearney St.....	Special.....	Aug 17
Navajo M Co., Nevada.....	J W Pew.....	310 Pine St.....	Annual.....	Aug 11
Silver West Cons M Co., Nevada.....	A C Ellis.....	414 California St.....	Special.....	Aug 10
South Feather W & Union M Co., Cal.....	J A Smith.....	320 Montgomery St.....	Annual.....	Aug 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co., Nevada.....	J Wetzel.....	330 Sansome St.....	50.....	June 15
Cons Cal & Virginia M Co., Nevada.....	A W Haven.....	309 Montgomery St.....	50.....	July 10
Idaho M Co., Grass Valley.....	J Wetzel.....	Grass Valley.....	3 00.....	Aug 1
North Banner Cons M Co., California.....	T J Mitchell.....	Grass Valley.....	70.....	Apr 20
North Commonwealth M Co., Nevada.....	J W Pew.....	310 Pine St.....	25.....	June 17
North Star M Co., California.....	D Jennings.....	401 D Street.....	50.....	Aug 3
Pacific Coast Borax Co., California.....	A H Clough.....	230 Montgomery St.....	1 00.....	Aug 10

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

- FOR THE WEEK ENDING, July 28, 1891.
- 456,715.—SASH BALANCE—W. Berry, Angel Island, Cal.
- 456,716.—SASH BALANCE—W. Berry, Angel Island, Cal.
- 456,877.—EAVES' TROUGH HANGER—M. Bingham, Shelton, Wash.
- 456,583.—HYDROCARBON BURNER—Blasdel & Morse, Los Angeles, Cal.
- 456,885.—REVERSING VALVE—H. T. Clarke, Portland, Cal.
- 456,720.—FISHING BOAT ATTACHMENT—Pedro Costa, S. F.
- 456,618.—KNIFE SHARPENER—A. Fritsch, Suisun, Cal.
- 456,818.—RAILWAY—W. S. Herrington, S. F.
- 456,623.—ROLLER QUARTZ MILL—C. C. Lane, San Diego, Cal.
- 456,830.—MACHINE WRENCH—M. Martin, Walla Walla, Wash.
- 456,870.—SCISSORS—N. A. Wheeler, Alpona, Wash.

The following brief list, by telegraph, for August 4th, will appear more complete upon receipt of mail advices: California—Owens C. Amegotti, San Francisco, holder for articles of table ware; Samuel H. Benson, San Francisco, steam boiler; Charles Cummings, Oakland, apparatus for transmitting power by means of compressed air; Charles Cummings, Oakland, rock drill; Alfred Dudden, San Francisco, pneumatic door check; Samuel N. Goldy, San Francisco, sash balance; Gilbert Tompkins, San Leandro, adjustable shoe weight for horses; Robert Vint and L. Goldberg, San Francisco; cigar stand and holder; Dornier Walsh, assignor of one-half to W. J. Davis, San Francisco, game apparatus; William E. Weldon, San Francisco, vaginal syringe; John S. Woolsey, San Jose, lawn sprinkler.

Oregon—Richard Clinton, Portland, car coupling; David H. Gotshall and H. Petit, Astoria, neckyoke.

Washington—Charles T. Anderson, Tampico, haling press; Michael E. Reilly, Monte Sano, window sash.

Notes.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Mining Share Market.

Comstock mining shares the past week did not make any startling, erratic moves, but gradually gained strength with slight fluctuations in the north end and middle group's shares. The first time for years Potosi sold higher the past week than did Cop. Virginia. What caused the advance is as yet a mystery. Some say it was by cross orders to make the short fills; others think that the management is preparing to show up the ore on which they made the little deal in 1890, while others, again, think it a bluff to sell out stock for the usual winter assessment hatching. As far as this is concerned, the movement along the entire line looks very much like an assessment deal, but to make it successful so as to more easily catch gudgeons, ore will have to be shown in an unexpected quarter, and this showing must or should be assisted by better bullion returns from other ore-producing mines. This, it is said, can be done by a little reformatory work in milling ore, for, as ore is milled, mining men say that which goes over \$60 and \$80 a ton is made to mill only from \$15 to \$25 a ton, the balance going to reported inside rings.

Outside mining shares are lifeless. A subscriber wishes to know why in mentioning coppers, we neglected to state about those who profess by some kind of mystical figures (a book of reported sales, prices, etc., being kept for the purpose), to be able to call the turns in the market. These creatures were not mentioned for the reason that we thought no person so credulous as to believe what is claimed, for if they do, they, in the end, will be knocked financially, higher than the proverbial "Gilroy kite."

News from the Comstock mines is of quite an interesting character. Col. Mackay is in charge of the North End mines and may possibly run into some of the high-grade ore reported by Senator Fair about 13 years ago. Much stress is placed on the 1100-foot level south drift in Con. Virginia. Sen-

ator Fair reported that on the 1400 level running south the ore was low grade, but running north it was high grade. Is it not reasonable to conclude that the same conditions obtain on the 1100-foot level? The Overman management is reticent about the high-grade ore officially reported when they made in last year quite a move in the mines shares. The management also reported important work in Caledonia at about that time. The find reported in Alpha by the superintendent in his annual report has been allowed to sleep; when it is to be reported found in lower down is an open question and only answerable when the pool wishes to deal out the stock again at a good round profit. Similar statements can be made of other mines in the Gold Hill group. Brokers are discussing the west ledge of the Comstock. About a year ago several of them visited the Comstock and were agreeably entertained by Supt. Keating. He took them down the Savage and Norcross mines, showed them around generally, and then, while examining the back-dike wall which forms the foot-wall of the Comstock lode, he is reported to have said: "We will have to penetrate this black dike wall and find something to the west, or we must get the water out and go for the deep levels, because the east country is exhausted of its ore." Since that time Chollar, which is on the south line of Supt. Keating's mines, penetrated that dike wall and found a quartz ledge to the west 50 feet wide. Rumor has it that Supt. Keating was instructed by the President of his mines to fill up the west drifts in his mines and that the orders have been obeyed. Savage, by some accident, has found some ore to the west of the incline, and this find is more than likely to be the cause of more inquiry for the west ledge. Con. Cal. and Virginia had to go east 200 feet from its shaft on its 1200-foot level to get into its "bonanza." Now it goes west 200 feet on its 1650-foot level to get into its new ore body, which ore is in the west ledge.

Sales at San Francisco Stock Exchange.

THURSDAY, August 6, 9:30 A. M.	
400 Andes.....1 15	450 Gould & Curry 1 60 @ 1 65
250 Belcher.....1 40	100 Hale & Nor.....2 05
100 Belle Isle.....2 00	200 Keenock.....7 50
200 Benton Con.....1 25	150 Mexican.....2 55
830 Best & Belcher.....3 35	200 Uphir.....3 50 @ 3 60
450 Bullion.....4 30 @ 4 35	450 Overman.....2 50 @ 2 10
400 Chollar.....2 00	300 Potosi.....5 75 @ 5 70
100 Chollar Co.....1 25	400 Savage.....1 50
370 Chollar.....2 55 @ 2 60	100 Scorpion.....4 40
250 Commonwealth.....4 00	350 Sierra Nevada.....3 25
320 Con Cal & V.....6 50	320 Union Con.....2 30
400 Con Pacific.....2 30	500 Utah.....1 50
200 Crown Point.....1 25	300 Yellow Jacket 1 70 @ 1 75
500 Exchequer.....85c	

San Francisco Metal Market.

WHOLESALE.		THURSDAY, August 6, 1891.	
ANTIMONY.....	22 @	141	
BORAX—Refined, in carload lots.....	8 @		
Powdered.....	8 @		
Concentrated.....	7 1/2 @		
All grades jobbing at an advance.			
COPPER.....			
Bolt.....	22 @		
Sheathing.....	22 @		
Ingot, jobbing.....	— @	15	
20 lb, wheels.....	— @	24	
Fire Box Sheets.....	22 @	24	
LEAD—Pig.....	42 @	24	
Bar.....	51 @		
Sheet.....	71 @		
Pipe.....	71 @		
Shot, discount 10% on 500 bags Drop.....	1 90 @		
Buck, 7 lbs.....	2 10 @		
Chilled, do.....	2 30 @		
QUICKSILVER—By the lb.....	41 @	50	
Flask, old.....	10 @		50
CHROME IRON ORE, per ton.....	10 @		
IRON—Bar, base.....	3 @	24	
Norway, base.....	16 @	24	
STEEL—English, B. & S.....	16 @	24	
Canton tool.....	9 @	9	
Black Diamond tool.....	9 @	9	
Pick and Hammer.....	3 @	10	
Machinery.....	44 @		
Toe Calk.....	44 @		
TINPLATE—B. V., steel grade, 14 1/2, spot.....	6 57 @		
Charcoal, Hx 20.....	6 57 @		
do, roofing, Hx 20.....	6 57 @		
do, do, 20 x 20.....	15 @		
Pig tin, spot, per lb., irregular, nominal.....	— @	21 1/2	
IRON—Glengarnock ton.....	25 @		
Eglington.....	25 @		
American Soft, No. 1, ton.....	— @	29 00	
Oregon Pig, ton.....	— @	27 00	
Puget Sound.....	— @	27 00	
Cl Lanes White.....	— @	33 00	
Shots, No. 1.....	— @	27 00	
Lauglan.....	— @	25 00	
Thorncliffe.....	— @	25 00	
Garthcarrick.....	— @	25 00	
Barrow.....	— @	25 00	
Carpoeth.....	— @	25 00	

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 16.	WEEK ENDING July 23.	WEEK ENDING July 30.	WEEK ENDING August 6.
Alpha.....	.65	.75	.60	.75
Alta.....	.70	.75	.85	.95
Andes.....	.85	1.05	.90	1.20
Belcher.....	1.10	1.45	1.25	1.75
Belle Isle.....	.60	.75	.60	.65
Best & Belcher.....	2.05	2.30	2.10	2.50
Bullion.....	2.45	2.85	2.10	3.15
Bodie Con.....	.60	.60	.70	.80
Bulwer.....	.35	.55	.30	.35
Commonwealth.....	.50	.60	.50	.55
Con Va. & Cal.....	5.82	6.75	5.50	6.25
Challenge.....	1.60	1.10	1.10	1.30
Chollar.....	1.60	2.20	1.75	2.00
Confidence.....	4.00	2.80	3.25	3.50
Con. Imperial.....	.40	.50	.45	.50
Caledonia.....	.45	.50	.45	.50
Crown Point.....	1.60	1.30	1.10	1.50
Crocker.....	—	.65	.10	.10
Del Monte.....	—	.20	—	.20
Eureka Con.....	3.00	3.60	—	—
Exchequer.....	.50	.60	.65	.70
Grand Prize.....	.15	—	.15	.15
Gould & Curry.....	1.20	1.40	1.10	1.60
Hale & Norcross.....	1.50	1.35	1.65	1.70
Julia.....	.10	.15	.10	.15
Justice.....	.40	.65	.40	.60
Keenock.....	.25	.25	.25	.30
Lady Wash.....	.20	.15	.20	.25
Mono.....	.20	.25	.20	.25
Mexican.....	1.80	2.15	2.00	2.65
Navajo.....	.25	.25	.25	.25
North Belle Isle.....	.30	.40	.55	.55
Nev. Queen.....	.30	.20	.30	.25
Occidental.....	.10	1.10	.40	1.00
Ophir.....	2.85	3.10	3.00	3.35
Overman.....	1.90	2.20	2.10	2.30
Potosi.....	3.60	4.00	3.85	4.25
Peelers.....	.10	.10	.10	.10
Peru.....	.10	.10	.10	.10
Savage.....	1.25	1.65	1.40	1.35
S. B. & M.....	.45	.50	.40	.50
Sierra Nevada.....	2.00	2.15	2.40	2.20
Scorpion.....	.30	.30	.35	.40
Union Con.....	1.80	2.05	2.10	2.35
Yah.....	.60	.60	.70	.80
Yuba.....	1.60	1.30	1.00	1.55

* Assesment added.

Assessment Notices.

NEW EL DORADO GOLD MINING COMPANY.
 Location of principal place of business, San Francisco, California. Location of works, El Dorado County, California.
 Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of August, 1891, an assessment, No. 2, of Five Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coins to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.
 Any stock upon which this assessment shall remain unpaid on the 15th day of September, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY the 31 day of October, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
 By order of the Board of Directors.
 J. W. FEW, Secretary
 Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

Educational.

JOHN T. EVANS,
 Assay Office and Chemical Laboratory,
 Rooms 46 and 47 MONTGOMERY BLOCK, 628
 Montgomery Street, San Francisco. For nearly 18 years with Thomas Price, as Chief of the Ore-Assay and Analytical Department. Lessons given in Assaying and Chemistry.

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 its graduates in every part of the State.
 Send for CIRCULAR.

C. S. HALEY, Secretary. E. F. HEALD, President.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST
 Borax Company, San Francisco, July 31, 1891.
 At a meeting of the Board of Directors of the above-
 named Company, held this day, a Dividend (No. 8) of
 One Dollar (\$1.00) per share was declared, payable
 MONDAY, August 10, 1891. Transfer books will close
 August 5, 1891, at the office of the Company, No. 230
 Montgomery Street, Rooms 11 and 12.
 ALTON H. CLOUGH, Secretary.

Practical Treatise on Hydraulic Mining.
 By AUG. J. BOWIE, Jr.

This new and important book is on the use and con-
 struction of Ditches, Flumes, Dams, Pipes, Flow of Water
 on Heavy Grades, methods of mining shallow and deep
 placers, history and development of mines, records of
 gold washing, mechanical appliances, such as nozzles,
 hardy cutters, rockers, undercurrents, etc.; also describes
 methods of blasting, tunnels and sluices; tailings and
 dump; duty of miners' inch, etc. A very practical work
 for gold miners and users of water. Price, \$5, post-paid.
 For sale by Dewey & Co., Publishers, 290 Market St., San
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WILLIS G. DODD, Vice-President and Manager.

IRA P. RANKIN, President.

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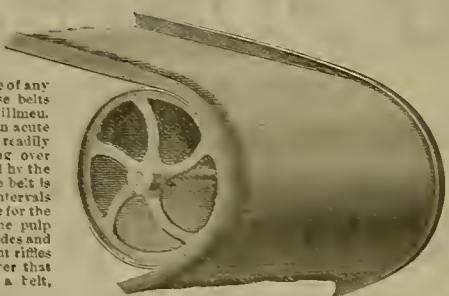
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We have now made arrangements to have
 our new Concentrating Belt manufactured in
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 on short notice. The length and width of these
 belts are the same as is used on the Frue or
 Triumph Concentrating Machines, but can be made of any
 length or width desired. The advantages of these belts
 over any others will be readily seen by practical millmen.
 First, the flanges or edges of our belt stand at an acute
 angle inclining toward the center, and therefore readily
 conform to the change of direction while passing over
 the end rollers; thus the vibration and loss caused by the
 frequent breaking of the flanges of the old style belt is
 practically done away with. Again, our belts, at intervals
 of two to four feet, have a very slight rifled surface for
 the space of three inches, which tends to equalize the
 pulp on the belt, and prevents it from banking on the sides and
 forming channels through the center. These slight rifles
 also save very fine sulphurets and the quicksilver that
 would otherwise escape with the tailings from a belt,
 the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

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BUCYRUS SYSTEM. NEW METHOD OF PLACER MINING.

Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.

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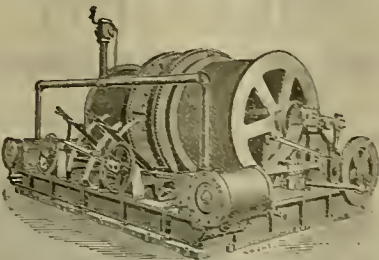
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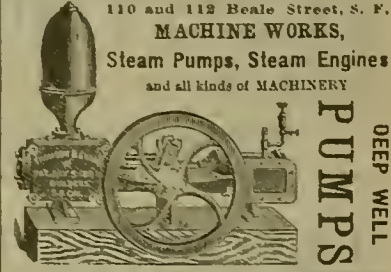
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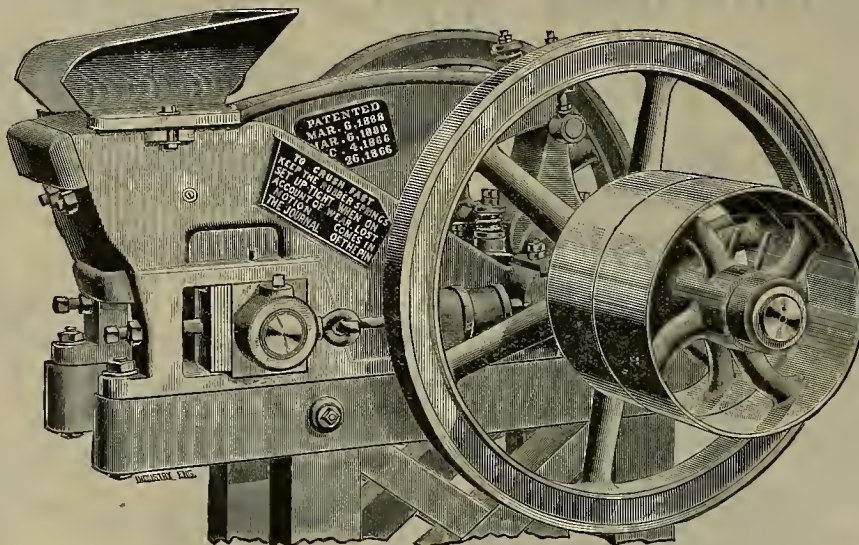
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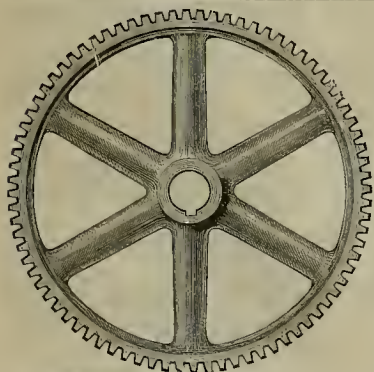
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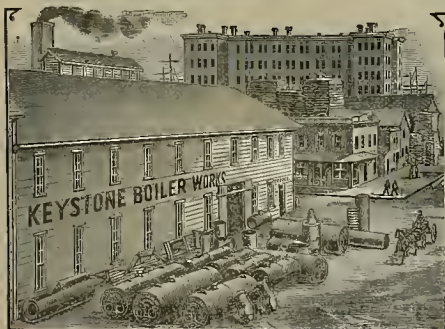
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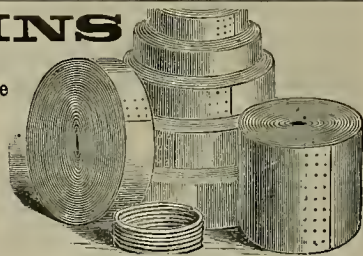
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FRUE ORE CONCENTRATOR

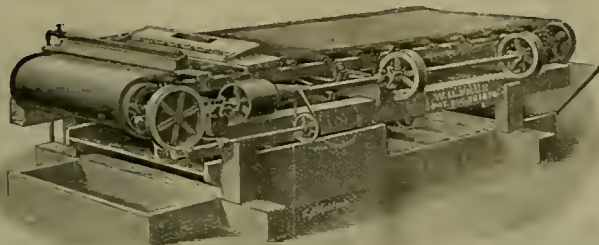
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



PROTECTED BY PATENTS—September 2, 1879
April 27, 1880; March 22, 1881; February 20,
1883; September 18, 1883; July 24, 1888.
Patents applied for.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

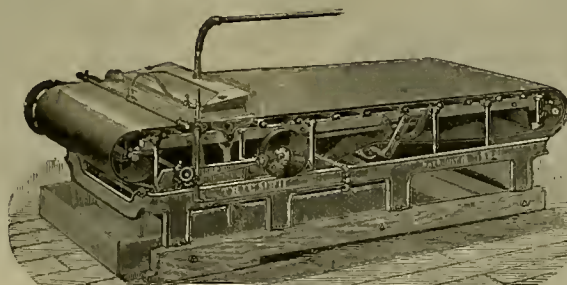
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - \$550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



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Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

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Location of Works, Orissa Valley, Nevada Co., Cal.
ORISSA VALLEY, NEVADA CO., CAL., Nov. 10, 1886.
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.

COMMENT—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

(Signed) Sup't North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.



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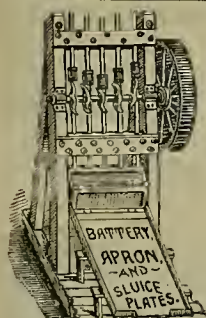
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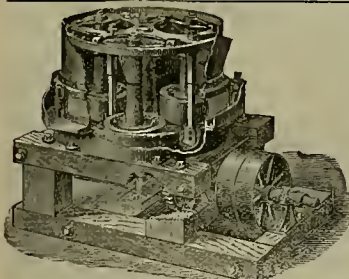
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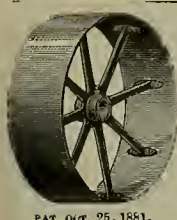
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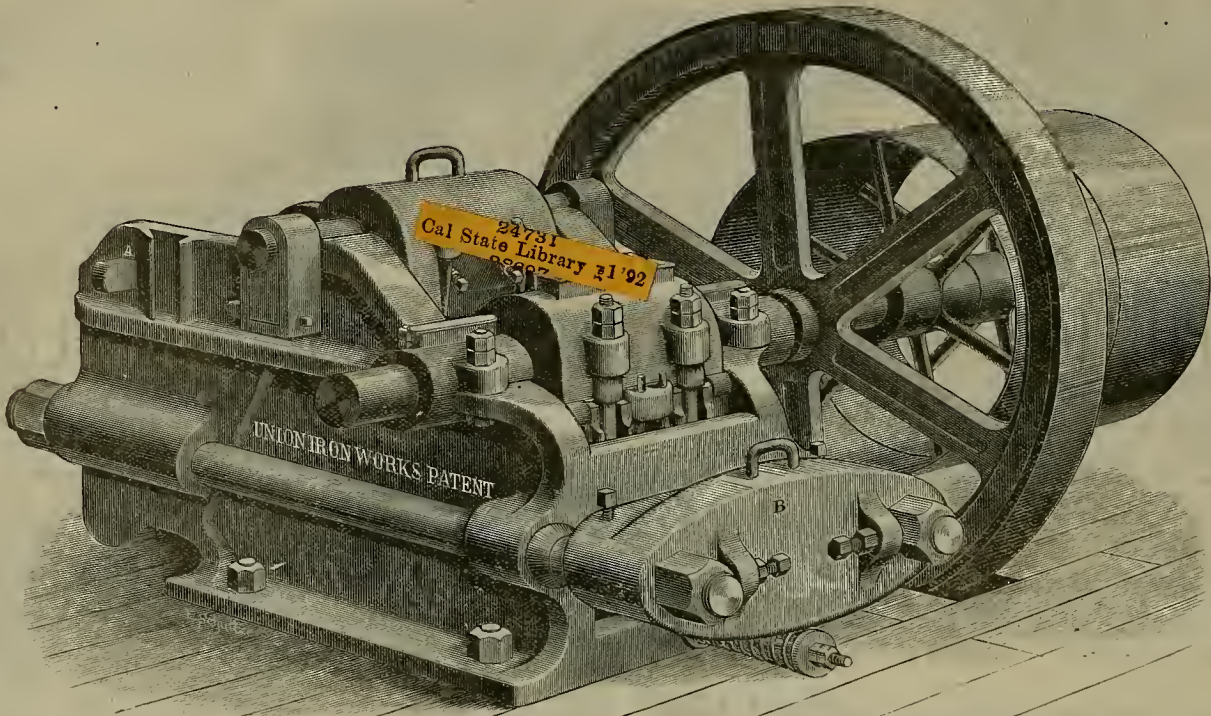
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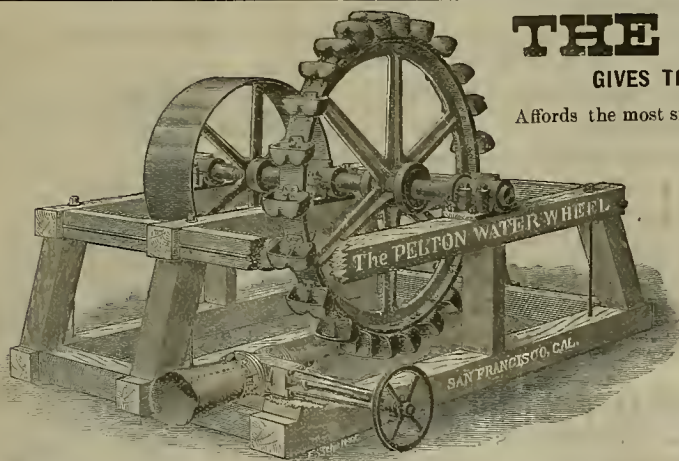


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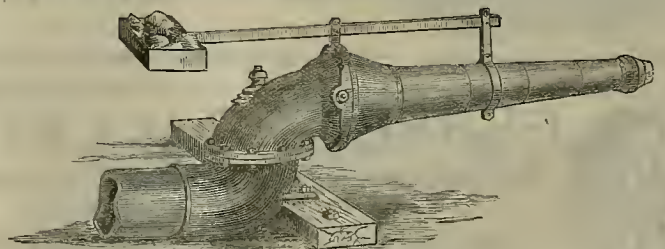
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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SAN FRANCISCO, SATURDAY, AUGUST 15, 1891.

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Crushing and Concentrating Ore.

The arrangements in a stamp-mill for crushing and concentrating ore are about alike in all mills in these days, practice and experience having long since proven the best system. Gravity plays an important part in the plans in vogue, the lump ore from the mine being dumped into the ore hoppers at an elevation, and the ore then passing downward to and through the various appliances for crushing, pulverizing and treating it, the tailings finally passing away at the lowest point. Few modern gold mills are without concentrating plants to catch the sulphurets, these being treated by a subsequent process.

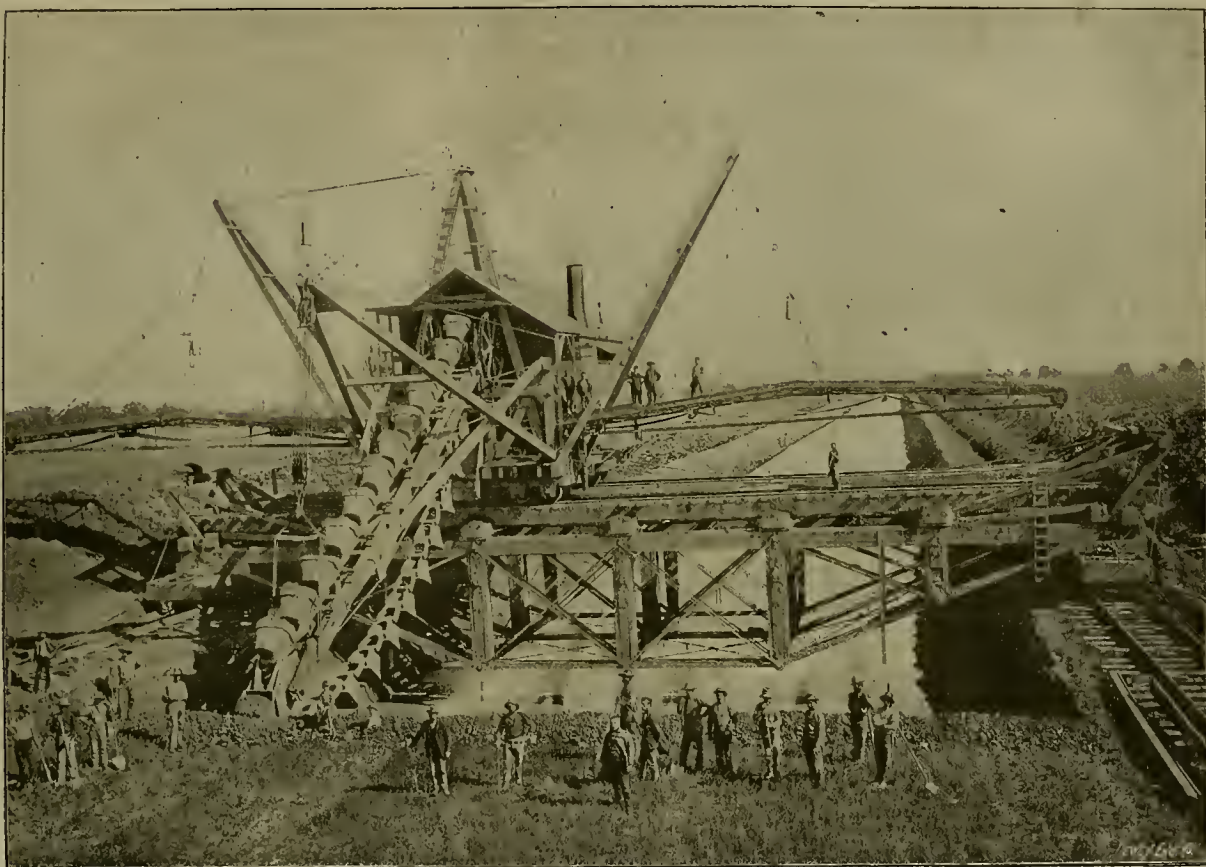
Two of the cuts on the first page of this number of the PRESS (for which we are indebted to the *Overland Monthly*) show the battery and concentrating floors of a large mill in Sierra county. The mill has 60 stamps, and there are 24 concentrators. The concentrating floor looks in the picture like a place with many complications of machinery, but in reality the machines are automatic in their action, and, regulated, once do their work with little attention. One reason that quartz can be worked so cheaply in these times lies in the fact that the machinery in use requires so few men to attend it. As to cost of working gold ore, some interesting figures are given in another article in this issue.

MINING BUREAU SURVEY.—John B. Hobson will soon commence, with a competent corps of assistants, geological and mineralogical surveys for the State Mining Bureau, his especial field being the counties of Nevada, Placer, El Dorado and Siskiyou. The work in Nevada county will be commenced in about two weeks, and will be made very complete of the quartz and auriferous gravel formations.

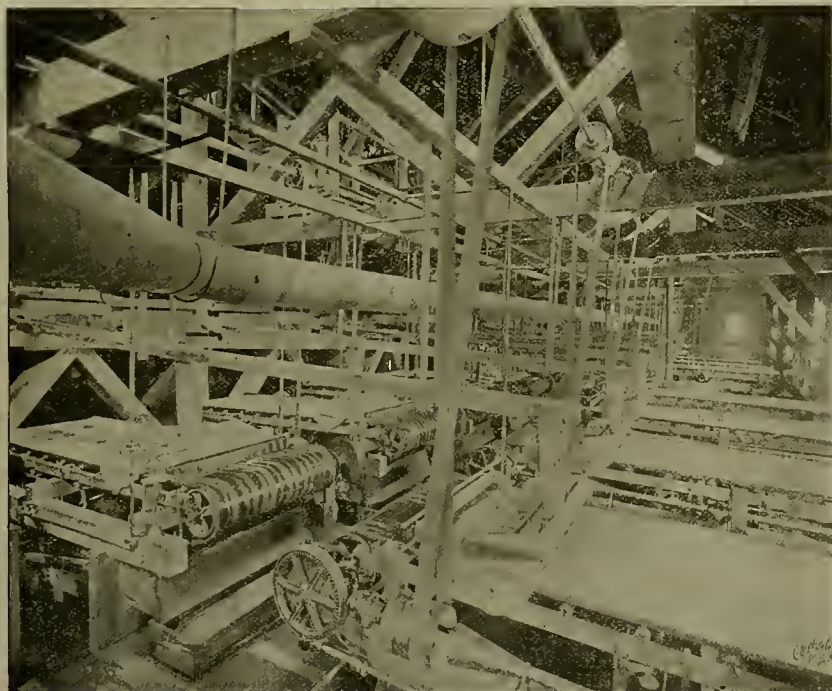
RAILROAD CONTRACTORS on the Tinto range line, Utah, have struck three valuable bodies of ore in tunneling in the mountains at Homansville pass on the east side of the mountains, in which the great mining camp of Eureka is situated.

A DIAMOND DRILL will soon be set at work at Willow creek, Siskiyou county, to prospect the coal beds there. Coal is now being taken from the old cuts opened.

THE quicksilver mine on the West Fork of Beaver creek, Siskiyou



SAN FRANCISCO BRIDGE COMPANY'S DREDGING AND EXCAVATING MACHINE.—See page 104.



CONCENTRATING FLOOR OF GOLD MILL.



BATTERY FLOOR OF A QUARTZ MILL.

CORRESPONDENCE.

we admit, unindorsed, opinions of correspondents.—Eos.

Calaveras County Mines.

(From our Traveling Correspondent.)

EDITORS PRESS:—Leaving Mariposa, I drove north to reach Amador county. Passing the old Calaveras, which is now idle, I reached Sheep Ranch.

The principal mine of this section is the Sheep Ranch, owned by J. B. Haggin, with W. H. Clary superintendent. The mine is keeping up its reputation, and at this time the shaft is being sunk from the 1100 to the 1200 foot level. The vein runs from nothing up to five feet in width. The high grade of the quartz, coned with the 1200-foot shoot, make the Sheep Ranch an exceptionally good mine. It is one of those mines that mining operators prefer to own entire—"good enough to keep"—and are not stocked, but little known, and not even mentioned in the report of the State Mining Bureau. If investors knew more of this class of mines, they would not be so quick to condemn mining and assert that it is not a legitimate and profitable industry. It is a difficult matter to give the exact output of this mine, as it is not always policy to publish the facts. Mr. Haggin, however, is credited with saying that the net profit is only \$80,000 a year, which is a very fair showing for a 20-stamp mill.

Indian Creek.

The old Right Bower is idle. Adjoining is the Washington, with genial Harry Harris in charge as superintendent, and he is the right man in the right place. The mine is being developed by lawyer Campbell of San Francisco. Previous to Mr. Campbell's securing the mine, it was operated by some parties who kept the mill running from waste of the dump pile. This paid about \$10 a ton, but as the sulphurets were largely from the country slate, which would go about ten cents an acre, the results were not satisfactory. Mr. Harris has confined himself to the vein and has shown up a body of ore that will pay for the mine before the bond expires. The higher grade ore is shipped to Selby & Co. and realizes as high as \$2.50 a pound. The average milling ore so far has been \$40, with 5 per cent of galena sulphurets that average \$300 a ton.

Mr. Jaquith is prospecting an old mine on the ridge, below the Washington, and it is hoped he will meet with the same good fortune that has come to Mr. Campbell.

The Ragge Bros. of Sheep Ranch are driving an 800-foot tunnel to cut the vein on the Equity mine, and will cut the vein at 280 feet in depth.

El Dorado.

There is little doing in this section. Mr. Rodaseni has a number of valuable prospects that are partly developed and worth looking at by investors. North of El Dorado and near Railroad Flat is a mine called the Greek. The mine is owned by George Nickolls, and, though easily reached, once you know the road, is difficult to find when, like the writer, you go on the hunt for it without a guide. Mr. Nickolls has put down two shafts each 80 feet deep and 110 feet apart. These shafts are under-
out by a drain tunnel showing a vein from one to two feet in width of ore, that, for a distance of 110 feet, averages \$20 to the ton. There are about 250 tons of the same class of ore on the dump. To further develop the mine, Mr. Nickolls is driving another tunnel, which will cut the vein and the ore shoot about 280 feet deep. This tunnel, when in, will prove the vein. The mine has the appearance of a good investment with time for development.

Railroad Flat.

This old camp has a large number of veins with short surface shoots which are worked to a profit by the miners. None of them have been given sufficient depth to prove them. There is a number of old mines that it is thought are good, but for some reason they are not worked. Among them is the Fine Gold (J. B. Haggin's) and the old Pettloot mine. This latter mine was very rich, but in sinking, the shoot was gone through. The superintendent drifted west instead of east, and not finding ore, closed down. It is the common opinion of all the old miners that the Pettloot is still a rich mine, if properly opened.

The Bald Eagle.

J. E. Euright is superintendent of this mine. The mine is situated on the south bank of the South Fork of the Mokelumne river, one mile north of Railroad Flat. The mine is opened by tunnels which cut the vein 250 feet deep and show its width to be 18 inches to seven feet.

The ore averages \$10 to \$15 a ton in free gold and three to four per cent in sulphurets. The mine has a ten-stamp mill, and is in active and profitable operation.

Calaveras Blue-Gravel Lead.

If any evidence were needed that the MINING AND SCIENTIFIC PRESS is extensively and closely read, and the articles of the writer accounted reliable, it is shown here. On my last trip through this section I called attention to this large, unexplored, unclaimed bed of blue gravel. Immediately after that article appeared, parties came in from all parts of the coast, and located the old, covered river channel from this point to Volcano, in Amador county. In a short time these locators will be at work, and

this section made to equal, if not excel her early placer history. At this time the principal work is on the

Lava Bed Mine.

This mine is about two miles south of Railroad Flat, and is situated on a fork or branch of the main channel. The cone is almost east and west, while the main channel, which is to the east, is almost north and south. The gravel is covered with about 100 feet of pink lava ash, followed, in this the Lava Bed mine, by an average of nine feet of blue gravel resting on a slate bottom. The wash is heavy, the gold coarse and bright. So far the channel has shown a width of 80 feet, though the rim has not been crossed in the last 100 feet of the drift.

Crosscuts have been driven 50 feet each way. The average value of the cement thus far has been \$4 in free gold, which can be washed out of the gravel. The remaining gravel seems to hold as much more, which can only be separated by crushing. This gravel deposit was the feeder of Neilson's gulch, as the gulch paid up to the lava. Mr. Lampton put down a number of shafts to strike the blue gravel channel. Beginning at Neilson's gulch is the Summit lead of 160 acres with extension of 50 acres, owned by Evan & Lampton. Adjoining is the Three Brothers—60 acres—owned by Lampton Bros., which joins the Lava Bed, 120 acres, owned by Evan & Lampton. Adjoining is the Wallace, 80 acres, owned by Evan & Lampton.

Next comes the Nut Pine, 140 acres, Haupt & Lampton owners. This brings the east and west channel up to the main or north and south channel. At the junction, Lampton & Evan have 160 acres. South on the main channel is the Shepherd and adjoining it the Swank & Gamble; while to the north of the Evan & Lampton is the Swank. From this point north, claims innumerable have been taken up. In addition to the work being done on the Lava Bed, the Nut Pine owners put a shaft down 128 feet and struck gravel, but were not able to handle the water with a common bucket, so stopped. Upon the main channel, Swank & Gamble put down an incline shaft 200 feet long, struck the lead, and will now erect a hoist. There is no trouble about operating any portion of the channel by incline shaft, as the gravel is in no place covered by over 150 feet of lava.

If all of these claims on the east and west channel were consolidated and operated through one, main tunnel from Neilson Gulch to the main north and south channel, the entire area could be drained and the whole district worked at a big profit. The present owners are not able to carry the proposition through, but will meet capitalists half-way in what looks to be a most promising enterprise.

West Point.

West Point, like some people, is never twice alike, and seems to delight in proving the old song:

"When you're up, you're up.
When you're down, you're down.
When you're half-way up,
You're neither up nor down."

Just now it is "neither up nor down," but looks as though it would soon be on its feet, and that to stay.

The Lone Star.

J. G. Rule is superintendent. This mine is now equipped with Barleigh drills, and with the cost of operating thus lessened in the exceedingly hard country rock, the mine bids fair to do well. The lower drift is being driven ahead, with eight feet of good ore in sight.

The Riverdale.

T. Severance is superintendent of the Riverdale. This mine, like the Lone Star, which is just below it, is being developed by tunnel to cut a shoot of ore that has been opened in the upper workings.

The Smith Mine.

The shaft is being put down by contract and is now down 135 feet. Drifts have been run about 100 feet on the vein, which show an average of two feet of vein matter, with granite walls. The ore in the shoot is of high grade. Adjoining, or rather paralleling the Smith, is the old

Blazing Star.

C. J. Moore is superintendent. At this time the shaft is being put down and has now reached 360 feet. In the bottom of the shaft the same shoot of ore that was cut on the 200-foot level is being opened, with the vein widening. The ore is of the same character. On the 260-foot level the vein was seven feet, with the ore, which was shipped to Selby & Co., realizing \$125 a ton. The ore now coming from the shaft, mills \$70 a ton in free gold and carries a large percentage of sulphurets that run from \$125 to \$700 a ton. This opening the shoot on the 360 level shows that the vein and the gold go down and give evidence that the Blazing Star will "blaze" the way to a new era of profitable mining in West Point by opening the old superficially worked and abandoned mines and giving them depth. E. H. SCHAEFFLE.

Oro Grande, San Bernardino Co.

EDITORS PRESS:—There is quite a boom in this camp, and sales are being made almost daily. As the veins all improve as they gain depth, this is liable to make a permanent camp. The Ophir mine, which has attained a depth of 175 feet, shipped 100 tons of ore to the Sidewinder mill, at Victor, a distance of 11

miles, which milled \$54 in gold per ton. There are still 450 tons of ore on the dump, which will give just as good returns. The owners of the mine contemplate erecting a mill of their own. There are eight men working at the mine taking out ore daily. The vein is about four feet six inches wide, two feet six inches of it being pay rock. The mine is owned by San Diego parties.

The Carbonate mine, from which a pocket of ore was taken out running \$30,000 per ton in gold, at a depth of 240 feet, is timbering up their shaft preliminary to active developments. Mr. Corbet, who was at one time foreman of the Contentment mine at Tombstone, A. T., has charge.

The Althea mine, owned by Blaisdel and Embury, located on the flat within about 200 yards of the townsite of Oro Grande, has a vein 50 feet in width, which, according to assays, will average \$20 in gold across the vein.

Other prospects are looking well, and as soon as a good mill, with a thorough, practical millman in charge is erected, this camp will produce considerable gold bullion. MINER

The Precipitation of Metals from Hyposulphite Solutions.

(Continued from last issue.)

Read by C. A. STETEFELD, of San Francisco, before the American Institute of Mining Engineers.

§ 6. Precipitating-Coefficients.

The precipitating coefficients of a sulphide solution are the quantities of silver, copper and lead precipitated for 100 parts of caustic soda, or caustic lime consumed in its manufacture. In the same way precipitating-coefficients can be established for sulphur.

If a metal is precipitated by an alkaline polysulphide, RS₂, one equivalent of the latter precipitates one equivalent, or a double equivalent, of the former, (x-1)S being liberated as free sulphur.

The following facts are of importance in reference to precipitating-coefficients for caustic soda. If the lower sodium polysulphides are prepared either from lye of proper concentration, but not of sufficient temperature before adding the sulphur, or from diluted lye by boiling it with sulphur, reagents may result with precipitating-coefficients for caustic soda far below the normal values recorded in tables A and B. This can only be explained by assuming that a part of the caustic soda remains free and uncombined with sulphur, which is actually the case. For this and other reasons already stated, it is not judicious to attempt the preparation of a solution containing Na₂S in perceptible quantity in order to save sulphur. A solution in which Na₂S largely predominates will always have precipitating-coefficients below the normal values for caustic soda.

On the other hand, very concentrated solutions of the higher polysulphides may give precipitating-coefficients far above normal values. Since, however, these abnormal values, as already stated, are only obtained by partial precipitation of silver, copper, and lead from a hyposulphite solution, and do not exist in complete precipitation, and consequently not in practical mill-work, the subject is without economical value, and will not be discussed here.

Although great accuracy cannot be claimed for the tables below, regarding actual mill-work, they will be sufficiently near the truth to base calculations of practical value upon them. They refer to freshly prepared sodium sulphide, and not to solutions oxidized by long contact with the atmosphere.

The following precipitating schemes may be considered of practical value.

A. Lead and calcium are absent, or only present in very small quantities.

Method 1.—Precipitation by Na₂S₂, or by CaS₂.

B. Lead and calcium are present in perceptible quantities, or lead alone is present.

Method 2.—Precipitation of lead by caustic lime, followed with precipitation of silver and copper by CaS₂.

Method 3.—Precipitation of lead and calcium by Solvay soda, followed with precipitation of silver and copper by Na₂S₂.

C. Calcium is present in considerable quantity, but not much lead.

Method 1, as given above, is here applicable; but in naming Na₂S₂ as precipitant under "C," it is distinctly understood that the reagent should be practically free from Na₂S, so that an oxidized solution contains only a minimum of Na₂CO₃. If it cannot be prepared with the amount of sulphur needed for the preparation of Na₂S₂ according to equation No. 1, more sulphur must be used.

In considering the economy of the different methods of precipitation, it would be misleading to rely only upon the figures given in the tables. There are other important elements that must enter into calculation, outside of the cost of chemicals, and the relative proportions of silver, copper, lead, and calcium in the solution. It is important, for instance, whether the lead-calcium carbonate can be profitably sold. If calcium predominates, the product may be exceedingly low in lead, and only saleable at the expense of the silver it contains. An equally important factor is the grade of the sulphides in silver. The lower the grade, the heavier the freight and the melting charges per ounce of silver, or the cost of refining if sul-

phides are treated at the mill. To this must be added increased expense in handling, namely, pressing, drying, sampling, and packing of precipitates. Evidently, general rules cannot be established regarding the most economical method of precipitation, but a calculation must be made for each individual case.

As repeatedly stated, tables for CaS₂ cannot be calculated on merely theoretical grounds. An attempt, however, is made in tables E and F, to base values for CaS₂ on actual mill-statistics.

A comparative test was made between Russell's sulphide and CaS₂ at the Cusihiuriachi mill, Mexico, as follows:

The mill, reducing 50 tons of ore per day, was run 38 days, using Russell's sulphide, and 21 days, using CaS₂ as precipitant. The quantities of chemicals consumed were as follows:

Using Russell's Sulphide:

Average value of ore: 35.1 ounces silver per ton.

Consumption of caustic soda: 4.4 pounds per ton of ore.

Consumption of sulphur: 2.9 pounds per ton of ore.

Using CaS₂:

Average value of ore: 39.0 ounces silver per ton.

Consumption of caustic lime: 24 pounds per ton of ore.

Consumption of sulphur: 10.3 pounds per ton of ore.

Outside of a difference in value, the ore was of exactly the same character in both cases. For better comparison, I reduce the above figures for CaS₂ to what they would have been in working ore of 35.1 ounces silver per ton, with the following result:

Corrected Values, Using CaS₂:

Consumption of caustic lime: 21.6 pounds per ton of ore.

Consumption of sulphur: 9.3 pounds per ton of ore.

To make these statistics more available for comparison, the composition of the sulphide should have been ascertained, besides the consumption in hyposulphite. Under the circumstances, I have to take the figures as they are. Considering what has been said about the preparation of CaS₂, and its deterioration by oxidation, the much higher consumption of chemicals involved in manufacturing CaS₂, compared with Russell's sulphide of equal efficiency, is by no means extravagant. To make comparison perfectly fair, we should add, however, for CaS₂ a gain of about 20 per cent in hyposulphite, on a basis of the quantity of this salt contained in freshly prepared Russell's sulphide. For convenience in calculation, the addition of calcium hyposulphite is put down as its equivalent of the sodium salt.

In the financial table F, the price of the caustic lime is taken at 3 cent per pound, and other chemicals as stated in table D.

It is interesting to compare table F with table D. Even under favorable assumptions for CaS₂, this reagent is, at stated prices for caustic soda, sulphur and sodium hyposulphite, very much dearer than Na₂S₂.

CaS₂ would be only cheaper where caustic lime can be obtained at much less than 3 cent per pound, and where the cost of sulphur is abnormally low compared with that of caustic soda.

For this reason, in examining different methods of precipitation for a special case under normal conditions, we may just as well pay no attention to CaS₂ in Method 1, and discard Method 2 altogether.

Finally, if in lixiviation a considerable amount of sodium hyposulphite is consumed to keep up the strength of the stock-solution, it will be more profitable, in most cases, to use an oxidized sodium sulphide solution in place of one freshly prepared. Although the cost of precipitation is thereby apparently increased, the total cost of lixiviation will be diminished.

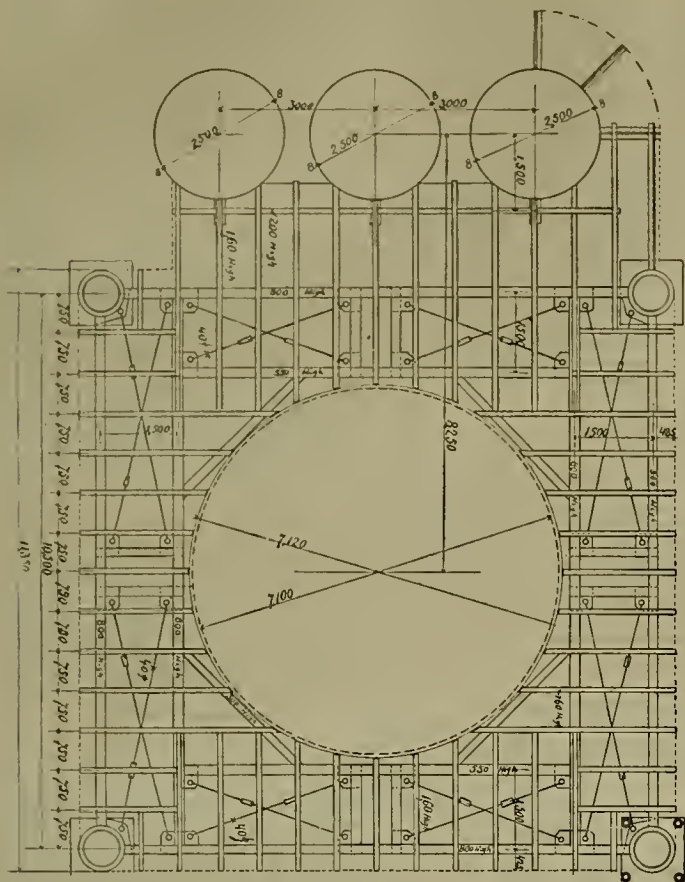
It has been claimed that in using CaS₂, the sulphides precipitate quicker and settle better than with sodium sulphide. This claim is not sustained by practical experience.

We find it stated in treatises on metallurgy that calcium hyposulphite is a more energetic solvent for gold than the sodium salt. This statement is without foundation in theory or practice. The solvent energy of calcium hyposulphite for silver-compounds is slightly inferior to that of the sodium salt, according to Russell's experiments.

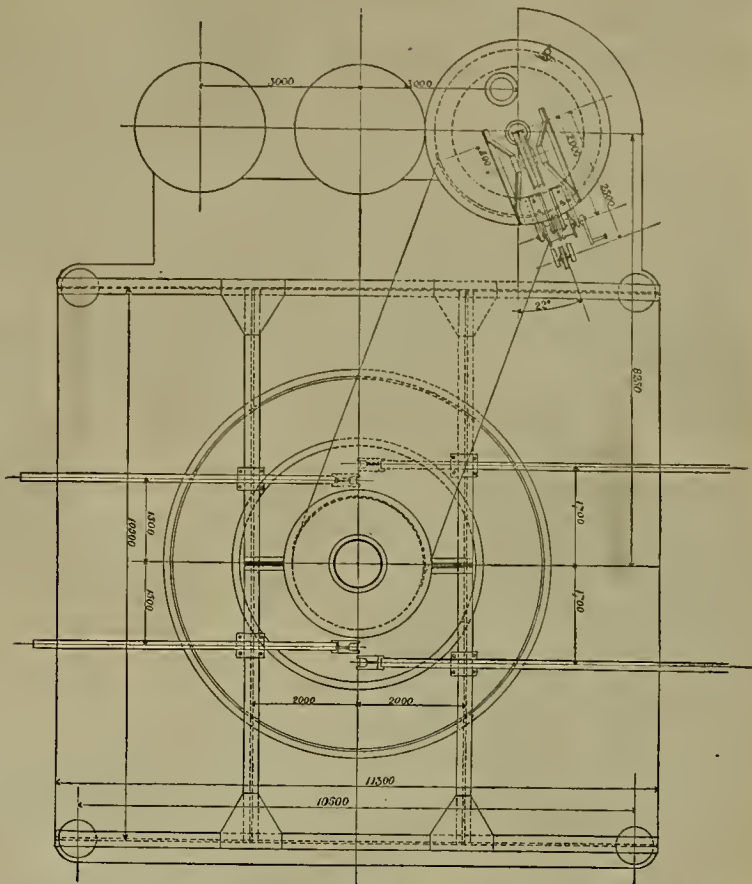
The difference in deterioration of the two hyposulphites by atmospheric influences has already been mentioned.

(To be Continued.)

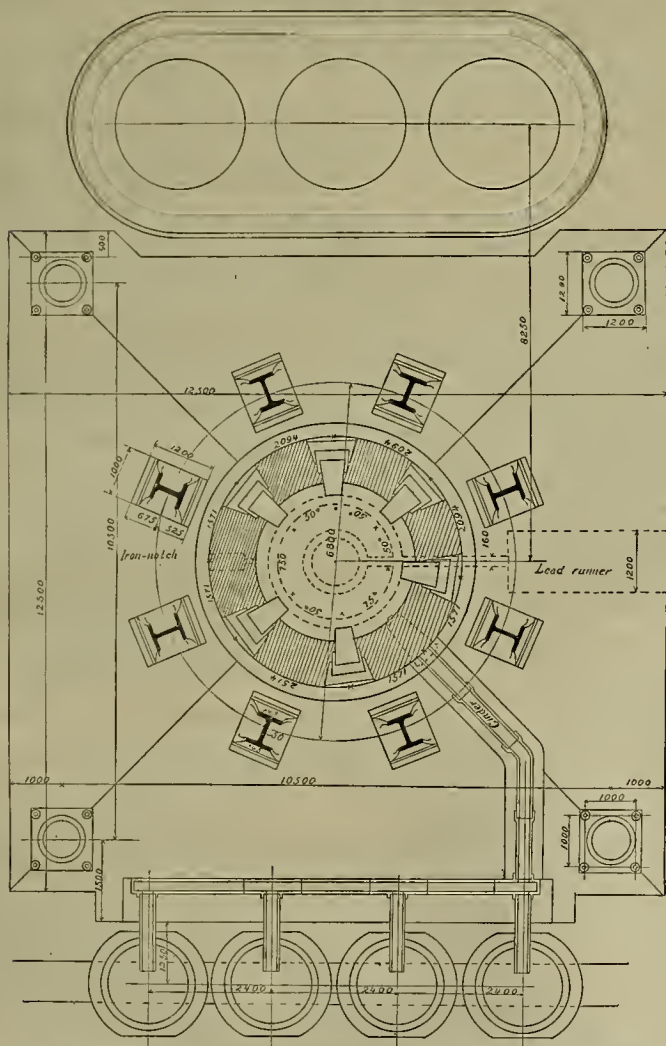
MEERSCHAUM.—Neff & Rogers put a number of men to work last week on their meerschaum mine, and have taken out some very fine specimens. While there is a large bed of the meerschaum, good solid specimens are rather scarce so far, but as the mine is opened up it will become more solid. Nearly all meerschaum pipes are made from the shavings, as large specimens of meerschaum are scarce in any country. Mr. Neff states that there is no question as to the discovery being meerschaum, as he has been in communication with several importers for some time past. One of the heaviest importers in the United States is trying to contract for the entire product of the mine, and expects to be able to ship it to Europe in large quantities. It is a valuable discovery, and one which will soon bring a great deal of money into Grant county.—Silver City (N. M.) Enterprise.



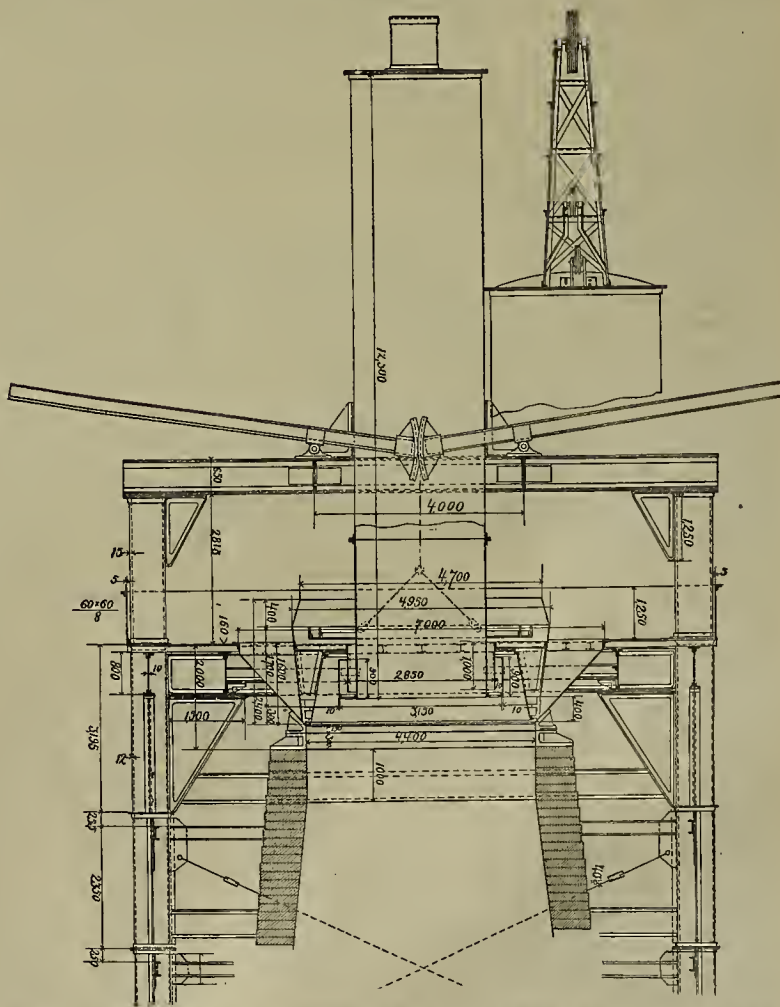
PLAN OF FRAME FOR TOP-PLATFORM OF NO. 1 BLAST-FURNACE AT FRIEDENSHUTTE.



PLAN OF CLOSED TOP AND CHARGER OF NO. 1 BLAST-FURNACE AT FRIEDENSHUTTE.



PLAN OF NO. 1 BLAST FURNACE AT FRIEDENSHUTTE.



VERTICAL SECTION OF CLOSED TOP AND CHARGER OF NO. 1 BLAST FURNACE AT FRIEDENSHUTTE.

German Progress in Metallurgy.

In recent numbers of the PRESS, illustrations have been printed showing certain features of the progress of German practice in metallurgy. These are from a paper by Dr. Herman Wedding of Berlin, read before the American Institute of Mining Engineers. In our recent numbers, plans and sections were given of the regenerative coke ovens and condensers for saving by-products. In this issue are shown drawings of the improved blast furnace at

Friedenshutte, showing that in furnace construction, practice inclines more and more to the entirely free stack without exterior masonry. Generally the furnace is closed in front as a corncob furnace.

The conditions of the German blast-furnace practice vary greatly. The native ores are nowhere nearly as rich as the more important ores employed in America; for instance, the specular ores of Lake Superior and the magnetites of the West. Perhaps there is no other district in the world where the furnace charge

carries so little iron as in Upper Silesia, where it falls sometimes below 30 per cent.

It is not merely the low tenor of the ores in iron, but also its usual accompaniment, a high tenor in silica, which causes this character of charge. Concentration of the ores is, with a few exceptions, impracticable financially. The finely divided condition of the ore in the gangue prevents any separation by gravity without a previous fine-crushing; and this, again, would introduce new difficulties into the working of the blast-furnace.

One disadvantage they have in common with the iron-masters of the United States—the necessity, namely, as a general rule, of railway-transportation over considerable distances for ores or coke, or both. But they lack the magnificent water-ways, like the great lakes of the North; and the development of internal canals, as a remedy for this natural disadvantage, is still delayed in Germany. The most favorably located furnaces with reference to raw materials are those of Upper Silesia, where the Friedenshutte furnace is situated.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

QUARTZ MOUNTAIN.—Cor. Amador Ledger, Aug. 8: The reverberations of giant powder are again being heard in the interior of the old mount. The company that has taken hold of operations this time is overhauling the old mill from the foundation up. L. Dunbar and a force of mechanics are making quite a change in the appearance of the mount. Arthur Call has charge of the operations. He intends to put in an entirely new plant for the purpose of saving the precious metal, and is very sanguine as to the results of some of his own improvements, the result of a seven years' experience at the Gover. Mr. Goodman and A. H. Bean still hold the fort at the Goodman mine.

OLETA.—A new party has started up the old Hill mine, and every one is in hopes they will get as far as the gold this time. The gravel mine below town is running along the same as ever.

Calaveras.

WEST POINT.—Cor. Calaveras Chronicle, Aug. 8: The Paddock and Morris mine is worked by shaft, and the hoisting is done by horse power. Twelve tons of free-milling rock were taken from this mine and worked, and the yield was \$122 per ton. The owners are taking out rich rock every day. The Dennison is also taking out some rich rock. Prospects look very favorable in the Woodhouse, Keltz and Camille mines. Last Saturday, Aaron and William Cook made a very rich strike in the old Anna mine, formerly owned by Wm. Steger. Prospects in the Horn Spoon mine show a valuation of from \$500 to \$500 per ton. Prospecting is still going on in the Novella, Mentzel and Chick mines. The Buchanan, Black Wonder and Smuggler mines are all turning out rich rock and giving their owners a rich harvest. I believe the Tom Paine mine will soon have a force of men at work and it is to be hoped will soon have its name recorded on the "good" list.

COPPER.—Cor. Amador Ledger, Aug. 8: Mr. Burgen is making preparations to start up his copper mine about two miles from Lancha Plana, on the Calaveras side of the river. When the mine gets in good running order it is said it will employ from 300 to 400 men.

El Dorado.

HYDRAULIC ELEVATOR.—Georgetown Gazette, Aug. 8: The hydraulic elevator at Mammoth Bar is doing splendid work in raising and washing river-bed gravel this season, under the management of Col. Davis. The California Water Co. furnishes the power—about 400 inches.

Inyo.

BIG PINE.—Cor. Inyo Index, Aug. 5: The boom so confidently predicted by the Index seems to approach this locality rapidly. Chances are largely in the direction of increased operations in the borax fields of Saline Valley. The unequalled success of the enterprising firm of Conn & Trudo of this place has stimulated others to investigate the merits of the extensive borax fields of that district. Mr. J. H. Roberts and H. J. Lent, accompanied by Gen. John Hewston, John Hewston Jr. and W. C. Chapin of San Francisco, left here for the claims of the first-named gentleman on Tuesday last. They went equipped for a thorough test of the merits of the locations, and if found satisfactory, the latter gentlemen will undoubtedly invest and put in a plant of large capacity for the production of the borax of commerce. There are many inquiries for Inyo mines on the part of San Francisco capitalists and agents of London companies. Mr. J. Sellier, a French expert of note in the mining circles of the continent, is now on a visit to the huge copper claim in the Saline Valley country, and this immense property is likely to be added to the list of foreign-owned mines. M. Sellier represents a London company largely interested in the development of mines in old Mexico. Should the company invest here, the Whale Copper mine will be thoroughly developed. Mr. Dunlap of Fish Springs visited the hamlet yesterday and reports a number of good cleanups in that camp.

Nevada.

HARTERY.—Grass Valley Tidings, Aug. 7: At the meeting of the stockholders of the Hartery mining company, it was decided to bond the Roach claim and work it in conjunction with the ground adjoining the Hartery, located by the company some time ago. The plant will be removed and a new shaft put down. The ledge will be cut at a depth of about 200 feet. A meeting of the directors will be held at once, and the new operations ordered. The decision by the stockholders was practically unanimous, 70,000 shares being voted for the proposition and but about 1400 against. It is understood that the bond price of the Roach claim is \$5000.

A LARGE LEDGE.—Down on Greenhorn there has been developed to some extent, by tunnel, a ten-foot ledge of quartz, which shows well in sulphurets and looks as though it would pay, under the proper conditions. The property is owned principally by Chas. Duval and M. Provines of this city.

RIVER MINING.—Grass Valley Union, Aug. 8: The Chinese Co. that is working in the river-bed on Bourne, Pollard & Co.'s location on the Yuba, below the junction, have a large section of the river-bed exposed, by the wing-dam that has been built, and are sinking a pit through the gravel. This pit is now 12 feet in depth, and it is expected that it will have to be sunk 25 feet in all. In sinking, a Chinese pump was found, which was used on the claim 25 years ago, and the present company, who knows of the former operations, says good pay was obtained, although the bottom was not reached, on account of there being too much water. This time the claim has been rigged up in a superior manner, with pumps that throw a large and constant stream of water, and a powerful derrick that will remove any boulders that may be encountered. It is the intention when pay gravel is reached to work night and day shifts in the claim. Three other companies are at work in the river besides the company above mentioned, but they are not so well advanced in their operations, but will not have to remove so much top dirt. The river does not fall as fast as was anticipated, as the water is yet about four feet in depth,

Plumas.

SPANISH RANCH AND MEADOW VALLEY.—National, Aug. 8: Last Sunday morning we went to Spanish Ranch and Meadow Valley. At Meadow Valley things were rather quiet, not many of the old miners being around. We made some inquiries, however, as to the mining outlook, and were informed that considerable prospecting is being done in the hills around about, and some good results obtained. On our return, we stopped at Spanish Ranch, where we found several of the old-time miners sitting around, telling of the "days of '49," how when they mined on the East Branch, at the end of a day's work, a yeast-powder can full of golden nuggets was usually picked up. There are several mines around Spanish Ranch that when opened up in good shape will pay a handsome dividend, and there can be but little doubt that a mining boom will strike that section before long.

GREEN MOUNTAIN.—Plumas Bulletin, Aug. 5: The force of men at work on the Green Mountain ditch have completed their work, the water has been turned in and put through the newly-laid pipe without any accident. The air-compressor at the mine has been put in order and probably it will be started to-day. The mine relieved of foul air, the work of repair and development will proceed to greater advantage, though up to date remarkably good progress has been made. Mr. Cornell and Col. Smith are giving the mine their personal attention, and the work is being pushed with energy. Considering the unexplored ground on either side of the tunnels into this mountain—a network of quartz veins—and the large ore bodies in the mines beyond the face of the Green Mountain tunnel, where ore bodies will be tapped from 1000 to 1500 feet in depth. The certainty of a big and profitable mine seems to be beyond question.

Sierra.

POKER FLAT.—Cor. Mt. Messenger, Aug. 8: Nick Berets is employing 17 men in his drift mine at Bunker Hill; 12 men are breasting. Tunnel 1700 feet, mouth to face; 1100, daylight to gravel. Water is beginning to slacken. Lead has just commenced to dry. Average yield of gravel, \$1.25 to \$2 a carload. Dark blue colored gravel, heavy, well-washed quartz boulders. Depth of pay streak, 3 1/2 to 7 feet; width, far as ascertained, 370 feet, with no rims in sight—possibly junction of two ancient river channels. Trains are run by hand power. New tunnel is contemplated in the near future to reach the lead, within only 500 feet. Water blast, 40 feet fall from ravine above, through 11-inch diameter iron pipe in tunnel, for ventilation. On an average, six to seven carloads to the pick—ten-hour shift—are rolled out; in harder ground, four to five loads. Gold is worth \$17.50 to \$18.50 at Scamman's bank, Downieville. Specimens, average value, from 25-cent pieces to \$2, \$3 and \$5. No snow is in sight on the adjoining mountain ridges and peaks. In sunnyside claim, southwest of Berets', tunnel is 500 feet long, within 100 or 150 feet of this comparatively unexplored channel, recently discovered by Mr. Berets—the best way to reach the lead. Prospects are bright for development of valuable mining properties hereabouts in the near future—very encouraging to miners. T. C. Corlett has begun preparatory work for next year, sinking an incline from his tunnel and employs three men. At Steamboat Hill mine, owned by A. R. Brown and Wm. Jones, there was a recent cleanup of \$700. They are helping John Curtis to tunnel through a point for a ditch for mining purposes. Frank Retzer is drifting at head of Illinois canyon, with favorable results. J. K. Walls, of Howland Flat, has a contract for 100 feet of tunnel, at \$8.50 a foot, through lava, for the Forest Queen Co. C. R. Scott is busy, as usual, developing his gravel claim and he believes that the back channel is very rich. J. Z. Hough intends extending his tunnel for the lower part of the rich Howland Flat channel, that he believes is within 200 feet of the face.

TUNNEL.—Mt. Messenger, Aug. 8: The tunnel being run on the quartz ledge at the head of Jim Crow canyon, by Mr. Rouse, reached the ledge last Saturday. The distance was 175 feet. The workmen drove into the ledge about three feet, which showed good-looking ore. This new tunnel gives a back on the front ledge of about 100 feet. Work on the mill was begun again the first of the week. The Fessler claim, at Alleghany, is reported as pay-quite as well as ever. The report is that \$10,000 were shipped last week. There seems to be a fair prospect that the Gold Bluff mine will soon be sold. The parties who were here recently to examine it, were well pleased with the prospect.

ANOTHER BIG CLEAN-UP.—Nevada Transcript, Aug. 8: Accounts from Fessler's quartz mine in the Alleghany district, Sierra county, continue to be very gratifying. If the property were 20,000 miles from here in some almost impenetrable locality peopled by bloodthirsty savages, an intense excitement would be created about it in the minds of California miners. But as it happens to be situated within less than a day's travel from Nevada City, the head-center of the richest gold mining region in the world, people take the marvelous yield as a matter of course and go along quietly about their business. Mr. Fessler has just taken over to Forest City another big lot of bullion estimated to amount to from \$60,000 upward, persons who ought to know claiming that the value of it far exceeds the sum mentioned.

GIBSONVILLE.—Cor. Mt. Messenger, Aug. 8: D. Corbett employs 20 men, working tailings in the North America creek. Horace Tabor has recommenced work on his old drift claim, the owners of which have recently incorporated under name of Tabor G. M. Co. Tunnel is in 2300 feet, in blasting rock, and will be pushed vigorously ahead to pay gravel. Altitude of the Thistle shaft is 5800 feet. Dined here with Supt. Gourley. Was down the 450-foot shaft with C. B. Wingate, General Manager, who showed me through the mine far as developed. Main tunnel crosses channel 500 feet, then swings northeastward. Heavy wash from shaft to end tunnel. A well-defined pay streak has been developed, and when main tunnel catches bedrock, breasting is to be commenced. The main tunnel will be run in the general direction of the old Bootjack shaft workings. At present there is only accommodation for 40 men. Contracts for provisions and timbers are being offered, and preparations made to work the mine for some time through the shaft. Amount of water to be pumped is not very large, but may increase considerably as channel is followed up the ridge. It is hoped and believed

that mine will be on a good paying basis in a few months. Shaft is in good order and needs very little repairing. Bedrock squeezes some in tunnel, but no swelling bedrock has been encountered. Extent of channel or width of pay streak are unknown, but indications evidence a wide and rich lead.

Siskiyou.

CINNABAR MINES.—Siskiyou Telegram, Aug. 5: After showing us through the mines, which in reality is a mountain of cinabar, and graphically explaining the process by which the ore is reduced, we visited the site where the company is building a fine furnace, the foundation of which has just been laid. This furnace will have a capacity of 20 tons per day of 24 hours. This is only one of several furnaces to be built later on when wagon communication is established with the outer world. This lack of a good wagon-road is a serious drawback, not only to the company, but to Siskiyou county as well. Mr. Geo. Senn says that he is in Siskiyou county, and wants to remain here, and to show his appreciation of the county and its people, has named his mine the Siskiyou Consolidated Q. M. Co. The company has 30 men at work at present, which force will be largely increased as soon as wagon communication is established.

EAST RIM.—Yreka Journal, Aug. 7: Lee, Lash & Co., of the Greenhorn mine, upon thoroughly investigating the bottom of their new shaft just sunk near the stage road, have discovered the east rim of the blue-gravel channel, which they have been working near Lee's house, and will commence running a drift in that direction, to tap the blue-gravel bed east of the drift where the cave occurred. From the appearance of the blue gravel near the bottom of this new shaft, the indications are more favorable for rich pay than at the old shaft, where they realized over \$6000 in two months. The Chinese Co., working the old Bentz Bar claim, near Honolulu, Klamath river, has been taking out considerable gold dust lately. The Bebe Bar claim, on Klamath river, which is now being worked for J. S. Cleland, prospects very well, considering no signs of bedrock have been reached. At the other Klamath river claims, the companies are not yet down to bedrock channel, but will be very shortly. Marshal Mahen returned from Beaver creek, Siskiyou mountain, last Sunday, and reports considerable mining in progress on Hungry, Beaver and Bumble Bee creeks. On the latter creek, Thos. Jones of Henley has a force at work on the California Queen quartz mine, which prospects well, and there are some four or five placer claims on the same creek being mined with good success.

Tuolumne.

TO HAVE A MILL.—Sonoma Democrat, Aug. 8: The Stanley mine, situated on Kanaka creek, one mile northeast of Jacksonville, on the east series of the mother lode, is to have a ten-stamp mill erected near by. Frank McCann is the superintendent, and the value of the property will soon be demonstrated. The vein is from 100 to 300 feet wide, and pays well in free gold and sulphurets, as denoted by the assays. The mill to be placed on the mine is the same which has been in use at the Patterson mine.

NEVADA

Washoe District.

CON. CAL. AND VIRGINIA.—1650 level—The various openings of this level have continued to yield the usual quantity of ore. Ore of fair quality has been extracted from the drift run west from the top of the upraise carried up 59 feet above the southwest drift, also from the drift run east from winze No. 3, 73 feet down, in working upward from that point. 1750 level—In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. The east drift from No. 1 winze, at a point 50 feet down, has been advanced 30 feet; total length, 56 feet, continuing in a quartz formation carrying a low assay value. There has been extracted from all parts of the mine during the week, 1374 80-2000 tons of ore, of which 265 1860-2000 tons were shipped to the Morgan mill and 1108 220-2000 tons to the Eureka mill. The average assay value of all of the ore worked at the Eureka mill during the week (1290 tons) was \$24.55 per ton. Bullion shipped to Carson Mint, assay value, \$78,477.10. The falling of the water in the Carson river has materially reduced the working capacity of the Eureka mill, and we have therefore resumed shipping ore to the Morgan mill.

OPHIR.—1465 level—We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore extracted during the week. The ore which was shipped to the Morgan mill, 290 tons, has been reduced, yielding bullion of the assay value of \$7,043.88; which has been shipped to the company's office in S. F.

MEXICAN.—On the 1465 level, the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift, has been advanced 40 feet; total length, 132 feet; in vein porphyry showing clay separations.

UNION CON.—The northeast drift started from the east crosscut No. 2 on the 1465 level, at a point 833 feet in from the main north lateral drift, has been extended 27 feet; total length, 110 feet; in vein porphyry carrying some clay, and fine lines of quartz of low assay value.

ANDES.—On the 420 level east crosscut, No. 2 from the main north drift was advanced 10 feet and stopped; total length, 210 feet. Have put in bulkheads in this crosscut to stop the flow of water. North drift from east crosscut No. 3 was extended 17 feet in quartz of low value. East crosscut No. 4 on this level will be started to-morrow.

CHOLLAR.—Extracted and sent to the mill the past week 57 tons of ore, worth \$19.11 a ton, as per battery samples.

POTOSI.—The winze is down 85 feet below the 1500 level. The bottom is in porphyry and stringers of quartz.

WARD SHAFT.—The south lateral drift from the 1800 is out 200 feet; face in soft porphyry.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level, is out 52 feet; face in quartz yielding low assays. North drift from winze, 550 level, is out 44 feet; face in quartz and porphyry.

EXCHEQUER.—East crosscut on north lateral drift,

150 feet north of the south line, 600 level, is out nine feet, face in clay and porphyry.

SILVER HILL.—South crosscut, 160 level, is out from the winze 650 feet; face in hard porphyry.

UNION SHAFT.—The west drift from the shaft, 900 level, has been advanced during the week 65 feet, a total distance of 850 feet; face in porphyry.

CON. NEW YORK.—The east crosscut, 1100 level, 535 feet north of shaft, is in 12 feet; formation soft porphyry.

OCCIDENTAL.—Have extracted and sent to the mill a total of 45 tons per day of fair-grade ore. The upraise from the 550 level at the head of No. 2 winze is up 22 feet, the top being in good ore. The south drift from No. 2 crosscut on the 650 level has advanced 12 feet; the face is in ore of the average value \$32 per ton. Milled during the week 305 tons of the average value of \$18.15 per ton.

GOULD & CURRY.—200 level: At a point in upraise No. 2, 100 feet up, started east on a small stringer of quartz and clay, which showed some value. Extended the same 10 feet. All work in the east and west crosscuts, 65 feet above this level, has been stopped. Started north drift in upraise No. 2, 65 feet above 200 level, and advanced the same 12 feet, through quartz showing some value.

BEST & BELCHER.—1000 level: West crosscut No. 3 has been extended 18 feet through porphyry and quartz showing some value; total length, 102 feet. 1100 level: West crosscut No. 1 has been extended eight feet and stopped; total length, 428 feet. Have not done any work in east crosscut.

UTAH.—On the 725 level the southeast drift has been extended 48 feet; total length, 94 feet, continuing in porphyry, clay and quartz formation.

SIERRA NEVADA.—On the 630 level, west crosscut No. 1, from the northwest drift, 571 feet from the shaft, is advanced 780 feet, 19 feet having been made during the week, in addition to smoke-house inside of drift 20 feet in length. The Kenosha tunnel has been enlarged and repaired 85 feet, leaving 80 feet to face of tunnel.

Arabia District.

RUN FINISHED.—Silver State, Aug. 8: Messrs. Saidmore & Sloan finished a run of 160 tons of ore from their mines in Arabia District a few days ago, which yielded 37 tons of bullion to the value of \$300 per ton. These gentlemen have a small furnace near Townsend and Fourth streets, in San Francisco, where this ore was reduced. They are enlarging their reduction works to the capacity of 40 tons per day, and will put a large force at work in their mines and ship several carloads daily.

Tuscarora District.

NAVAJO.—Times-Review, Aug. 7: The upraise from the intermediate drift has been extended 39 feet; no change elsewhere.

COMMONWEALTH.—No. 1 winze from the 4th level has been sunk five feet, and drift started to crosscut to the vein; progress made, 12 feet.

BELLE ISLE.—Line crosscut, 350-foot level, extended 12 feet, rock very hard.

DEL MONTE.—Third level: No. 2 north drift advanced 22 feet, face being all in low-grade ore, with seam of good ore on footwall.

NORTH COMMONWEALTH.—Third level: Have run an intermediate drift from top of No. 2 raise, a distance of 15 feet in fair-grade ore, average assay car sample, \$62 per ton. North drift from No. 1 winze advanced 28 feet, in vein matter.

NORTH BELLE ISLE.—East crosscut from the south gangway, 400-foot level, extended 19 feet. North drift from the south line crosscut, same level, extended ten feet; the vein is showing considerable spar.

Hawthorne District.

LAPANTA.—Walker Lake Bulletin, Aug. 8: The stope above the east drift, No. 6 incline, shows about 20 inches high-grade ore. In the east drift from the winze below the 100-foot shaft level, the vein is showing strong, carrying all high-grade ore; pitching south-west.

PAMILCO.—Have started a south drift on the ledge cut on the tunnel.

CENTRAL.—Stopping on the 150-foot level. Taking out the usual amount of ore.

MOUNTAIN KING.—Still drifting north on the main vein; ledge running from two to three feet wide, showing gold, lead and silver ore.

FAIRMOUNT.—Drifting south on the main drift; drifting north from the bottom of the winze below the tunnel; ledge showing well at all points.

HARTFORD.—Ledge has improved considerably during the week. About 20 inches between the walls showing considerable heavy lead.

GOLD BAR.—South drift, Martinez tunnel level, being extended on the vein, producing some ore.

WAR EAGLE.—Stopes yielding the usual quantity of good ore.

IDA.—Still producing the usual amount of high-grade ore.

NEW YORK.—South drift on the vein is being extended. The vein is very strong; about two feet wide, carrying gold and a strong streak of heavy lead.

El Dorado District.

MINING SALE.—Pioche Record, Aug. 6: The Southwestern Mining Company of El Dorado Canyon has purchased another lot of mines from John Powers there. The mines now sold are the Ea Extension of the Wall Street, Dutchman, Banner, Free Coinage and Roadside claims. The consideration paid was \$4700. These claims are mostly gold producers and adjoin the Wall Street mine, which the company has so successfully opened up during the past year. The new purchase indicates the confidence of the company in the district, who have operated in that district for many years past in the face of the greatest difficulties, but have made it pay, and now have a showing which they cannot exhaust in a year's hard work.

Pine Nut District.

PROSPECTS OF THE DISTRICT.—Virginia Chronicle, Aug. 7: Tony Cramer is on the Comstock, having recently returned from Pine Nut, where he located what he considers a rich claim within 200 feet of Zirn's bonanza. Cramer is much elated over the prospects of the district, and after securing necessary tools and machinery, will return to the scene of his labors. The daily arrivals at Pine Nut are somewhat astonishing, many arriving each day, but the population is not stationary, as a great many of the new arrivals are experts sent by syndicates in the East and California, who would not know gold or silver, unless it was coined, or whether the formation was igneous or aqueous. They might pick

up a handful of surface soil in a cattle corral, and through their sense of smell decipher its component parts. Pine Nut is but 25 miles from Carson City, a little south of east. Some of the claims are placer, but water is an unknown quantity in the locality. A dry washer is being worked by parties there with good results. The ore found is very rich, the rock showing a volcanic formation, resembling molten lava. The recent rich finds there have lent an impetus to the mining industry of Nevada, and Carson being the *entrepot* for the district, Pine Nut and its prospects form the principal topic of at the Capital city.

Pioche District.

MEN WANTED.—Pioche *Record*, Aug. 6: One hundred and fifty new men are wanted by the Pioche Con. M. & R. Company this month. Of this number, 100 must be practical miners who will be engaged here and in vicinity taking out ore from the company's various mines to have a good supply at the smelters when starting. Fifty additional men can find work along the line of the Jackrabbit railroad.

Oseola District.

NUGGET.—Eureka *Sentinel*, Aug. 8: A gold nugget weighing 53 ounces, besides the quartz, was recently found at Oseola. It is a small howler and only polished a little, indicating it had not traveled far. Some years ago another nugget was found near the same place, of the value of \$5000.

BRITISH COLUMBIA.

WAIT AT LEAST ANOTHER YEAR.—Nelson *Miner*, Aug. 3: Every mail brings letters of inquiry to the *Miner* from people who wish information regarding the Kootenay Lake country. To all these people but one answer can be given: At present there are at Nelson and Ainsworth as many business men and mechanics and laboring men as there is business or work for. Until the mines in Toad Mountain and Hot Springs districts are developed, there will not be business to warrant any large immigration to this section. People should wait at least another year.

REVELSTOCK SMELTER.—From passengers who arrived this week from Revelstock, the *Miner* gains the information that the smelter at Revelstock is doing good work, and that its owners and the resident manager are elated at their success.

IMMENSE LEDGES.—A. S. Farwell, who spent last month in surveying the townsite of Trail and mineral claims to Trail Creek district, returned to Nelson on Friday's train. He reports the ledges in that district of immense size and the country easily accessible. The principal claims are distant not more than six miles from the Columbia, and are not more than 2000 feet higher. But little work is being done, claim owners preferring to wait for purchasers.

ORE SHIPMENT.—The first shipment of ore from Hot Springs district arrived at Nelson on Sunday. It consisted of 514 sacks from the Number One mine, and was forwarded by the Columbia & Kootenay railway to East Helena, Montana.

DEVELOPMENT WORK ON THE SILVER KING.—To-day the owners of the Silver King awarded Robert Yuill a contract to do work that will go far to prove the value of that property. The main tunnel is to be extended 150 feet; a crosscut is to be run from the bottom of the shaft; and the ore body crosscut to several places.

CLEANUPS.—The Whitewater Co. has got the mill on Rover creek working finely, and Manager Davys reports that cleanups will be made regularly hereafter on the 1st and 15th of each month.

BELL WEATHER.—Amador *Ledger*, Aug. 8: The drifting operations at this claim, the property of S. W. Bright, of Jackson, have encountered the ledge. The quartz is considerably broken up and most of it is of low grade. About two feet is of excellent quality, estimated at from \$15 to \$20 per ton. The width of the ore body is only yet ascertained. The flow of water is still larger, and has increased materially since the ledge was struck.

BELMONT.—Tunnel No. 1 now is 380 feet. Plans have been submitted for bids on additional ten stamps. Mine is looking well, and at present two stamps running and doing good work.

MISCELLANEOUS.—The sinking of a shaft has been commenced at the Clinton Consolidated. Drifting at the North Star has reached within a short distance of the Comet claim. Crosscutting will be inaugurated, and if this should not develop anything encouraging, it is more than probable the property will be abandoned without entering the Comet ground.

SUTTER CREEK.—Water was turned on at the South Eureka last week, and sinking is now being energetically prosecuted. The new pipe gave no sign of leaking, and everything about the works is of first-class order.

IDAHO.

RICH ORE IN THE VENUS.—Wood River *Times*, Aug. 5: Vladislav Domske came down from the east fork of Wood River. He reports that exceedingly rich black sulphurates of silver were cut into yesterday at the Venus mine.

THE TRIUMPH TO SINK.—The Triumph Mining Co. is making preparations to resume sinking in its east vein. It will sink 200 feet below the crosscut from the bottom of the shaft before stopping again, and this will give it at least 300 feet of "backs" to open.

AT VIENNA.—Chris J. Johnston is to return to Vienna to a day or two. He has let a contract to continue the tunnel in the Vienna vein from the South Boise side, and will next ship a sample lot of the Mountain Kieg ore to St. Louis to have it tested by the various systems of concentration. While this is being done, he will procure a new steam hoist and pump for the Solace, in order to resume work there.

MONTANA.

AT BUTTE.—*Miner*, Aug. 7: Butte's principal industry—mining—has not been on the wane in this city during the past week. The same old-time activity is apparent on every hand, and additions to the long list of paying properties are being made every day. The Boston and Montana Co.'s mines and smelters are in operation, and under the able management of Capt. Thos. Couch, the company is reaping the harvest to which its enterprise entitles it. At the Lewis and Clark the new hoisting engine is being put in place. The task of putting to a

station at the 600-foot level is about finished, and on the starting of the new hoist sinking for the 1000 will be resumed. It is the intention of the Boston and Montana Co. to run levels from a depth of 1000 feet in the new shaft to the ground of the Mountain View and then to the Harris & Lloyd property, both of which belong to the company. Levels from this depth on the low ground will strike the Mountain View veins at a depth of 1600 feet, and the Harris-Lloyd at a depth of about 1400 feet. The scheme is a great one, and in addition to making a grand outlet for the ore, will supply fresh air to all the company's mines. The new shaft is to be supplied with a large Cornish pump, and it is the intention to have just fall enough to the levels from the Mountain View and Harris-Lloyd to permit the water from these two properties flowing to the new shaft, where it can be handled with ease.

BUTTE AND BOSTON.—The capacity of the smelter portion of the works of this company is now 400 tons per day, while the mill crushes about 75 tons more. The company's bullion shipped by the express offices of this city all comes from the mill, while that contained in the smelted ores goes out by freight in the shape of matte. The ore milled is taken principally from the company's silver claims on the hill, while that smelted comes from the Silver Bow, Ground Squirrel, Belle of Butte, East Gray Rock and West Gray Rock.

OTHER PROPERTIES.—Both mills belonging to the Alice Co. are running full blast, turning out more bullion than ever before. The supply of ore is coming principally from the Alice proper, but the Blue Wing and Magna Charta can be made to yield an unlimited quantity of ore if required to do so. Sinking was resumed in the shaft of the Alice during the early part of last week, and the work will be kept going until the 1500-foot level is reached, the 1400 having been passed.

LOWER CALIFORNIA.

CUSTOM MILL.—*Lower Californian*, Aug. 3: C. C. Lane has sold his mill in Alamo to J. O. Sheldon, who will operate a custom mill in the camp. Col. Lane retains the boiler, engine and rock-crusher of the mill, and if a favorable location can be found somewhere else in Lower California, he will re-engage in the business.

NEW MEXICO.

LONE MOUNTAIN.—Silver City *Enterprise*, Aug. 8: Lone Mountain, though not exciting any unusual commotion to the mining world at present, contains many valuable mining properties, some of which in the past were noted producers. While some exceedingly rich ores have been produced, the major portion of the mines are comparatively low grade. A few of the claims created a noise in the mining world, in years gone by, and may once more attract the attention which they deserve.

MAMMOTH MILL.—The Mammoth mill, at Pinus Altos, which has been undergoing extensive changes, is now ready to start up. The mill is complete in every detail, and is arranged to work ores at the lowest possible expense. The foundation was laid for 20 stamps, but only to were placed in position. The others will be added in a short time. The mine is well opened up, and capable of supplying an unlimited amount of ore.

GEORGETOWN.—Mineral was first found in this camp by Capt. McNulty about 18 years ago, since which time fabulous amounts of wealth have been extracted. This camp, as all others, has had its fluctuating periods, working at different times from 50 to 600 miners. At the present time, not more than 200 men are being employed.

GRANT CO.—The mine industry in Grant county is in a flourishing condition, and the output from the mines will eclipse all previous records.

COOK'S PEAK.—Silver City *Enterprise*, July 31: Lying upon the eastern slope of the Black Range mountains, near the southern extremity, is situated one of the most promising silver-lead camps in the Southwest. The camp takes its name from Cook's Peak, a prominent landmark which can be seen for 50 miles in all directions. The camp has been a producer for a number of years, but until within a few years no development work of an extensive scale had been attempted. The properties being all owned by poor men, work was conducted in a desultory way, until within a year or so ago several companies took hold of the different claims and opened them up systematically. All the mines upon which any considerable amount of work has been done have demonstrated to a certainty that large bodies of ore existed, and that they were of high grade.

WASHINGTON.

NEW PLACER DIGGINGS.—O'Kanagan *Outlook*, Aug. 3: A party of prospectors, consisting of C. C. Sands, Chas. Seibert, Will Hicks and R. H. Redmond, while camped in a gulch on the northeast slope of Palmer mountain one day last week, discovered gold in the gravel to which they were digging for water to cook their grub with. They washed some of the dirt and found it worth about 25 cents a pan. They immediately went to work and located four claims, or 80 acres, and are now busy prospecting to ascertain the extent and richness of their pay ground.

FIRST THOUGHT MINE.—We learn from Supt. Fisher that tunnel No. 3 has cut the vein at a distance of 645 feet. This taps the ledge at an average depth of 600 feet for the whole of the claim. The point where the tunnel has cut the vein is just beyond the north end of the north ore chute, which, on the upper levels, proved to be over 700 feet long. Before drifting south to explore this ore chute from No. 3 tunnel, an air connection with No. 2 level, some 210 feet long, has yet to be made. The work of sinking the air shaft has progressed already 60 feet, and the raise will be started next week. Streaks of good ore at the point of intersection give good encouragement that but a short drift will have to be run south before the main ore chute will appear.

A PARTY OF SURVEYORS.—Under the direction of Chief Engineer Mesab, has started from Sutter Creek to-day to run preliminary lines for the proposed Amador electric railway from Ions City to the several towns on the famous Mother lode of Amador county.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 4, 1891:

- 457,101.—HOLOER FOR ARTICLES OF TABLE-WARE.—O. C. Amyot, S. F.
- 457,177.—BALING PRESS.—C. T. Anderson, Tampico, Wash.
- 457,244.—DEEP-WELL PUMP.—John Bean, Los Gatos, Cal.
- 457,103.—STEAM BOILER.—S. H. Benson, S. F.
- 457,108.—CAR COUPLING.—R. Clinton, Portland, Or.
- 456,941.—TRANSMITTING POWER.—Chas. Cummings, Oakland, Cal.
- 456,942.—ROCK DRILL.—Chas. Cummings, Oakland, Cal.
- 456,945.—PNEUMATIC DOOR CHECK.—A. Duden, S. F.
- 457,195.—SASH BALANCE.—S. N. Goldy, S. F.
- 457,269.—NECK YOKE.—Gothall & Pett, Astoria, Or.
- 457,049.—STAPLING MACHINE.—John Helm, Seattle, Wash.
- 457,092.—STUMP PULLER.—W. B. Morris, Seattle, Wash.
- 457,010.—WINDOW SASH.—M. E. Reilly, Montebello, Wash.
- 457,168.—WINDMILL.—R. B. Sinclair, Alameda, Cal.
- 457,235.—HORSESHOE WEIGHT.—G. Tompkins, San Leandro, Cal.
- 457,037.—CIGAR STANO AND HOLDER.—Vint & Goldberg, S. F.
- 457,018.—GAME.—Dormer Walsh, S. F.
- 457,176.—VAGINAL SYRINGE.—W. E. Weldon, S. F.
- 457,099.—LAWN SPRINKLER.—J. S. Woolsey, San Jose, Cal.

The following brief list by telegraph, for Aug. 11 will appear more complete on receipt of mail advices:

California.—Franklin W. Choate, San Diego, car-wheel and rail; Frederick W. Dohbel, Purisima, wagon brake; Henry P. Holland, assignor to J. A. Fleher, San Francisco, machinery for propelling vessels; Raodell Hunt, San Francisco, concentrator of sub-aqueous structures; William Johnson, Pomona, hose coupling; Edward C. Moulton, San Francisco, pea sheller; William S. O'Brien, San Francisco, eyon; Klaus Oleison, San Francisco, crutch; Edward D. Pike, San Francisco, detonating top; Isaac Smith, Foller, saw sets and axle; Warren Kyjoid and J. G. Burgess, San Diego, vehicle running gear; George A. Williams, assignor of one-half to F. Jones, San Francisco, heating attachment for gas burners.

Washington.—Charles T. Penninger, Prescott, trousers flap supporter.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FISHING-BOAT ATTACHMENT.—Pedro Costa, S. F. No. 456,720. Dated July 28, 1891. This attachment for the use of fishing boats, consists of booms adapted to project from the opposite sides of the vessel, means for attaching said booms and keeping them in place, and means for connecting the ropes of a net so that the latter may be kept open while towing behind the vessel. The booms at the sides of the vessel are like boat booms, and to the ends of these the lines of the net are connected, the lines being about 120 fathoms in length; and by reason of the distance between the outer ends of the boom, the net, which is towed behind the vessel, is kept open to gather any fish which may be encountered. By means of other lines the tow ropes of the net are brought into line with the stern of the vessel, when the net is to be hauled in. Winding drums furnish a means for readily drawing in the net so that it can be hauled aboard and the fish captured.

STEAM BOILER.—Samuel H. Benson, S. F. No. 457,103. Dated Aug. 4, 1891. The object of this invention is to provide a means for preventing the cold water, when first introduced into the boiler, from coming in contact with the highly heated parts of the fire-box and stay-bolts, whereby the latter are loosened and destroyed and the boiler caused to leak. A diaphragm or partition is fixed across the shell of the boiler at some suitable point between the inlet opening and the fire-box. It extends upward from the bottom and sides of the boiler sufficiently to prevent a current of cold water flowing directly along the bottom of the shell, but not high enough to prevent a free and rapid circulation of the water between the tubes. The plate or diaphragm to no case extends above the upper row of tubes, thus leaving several inches of water in depth above its upper edge and a clear space above the surface of the top tubes for the return of the water in its circulation. This enables the water to flow into the water-legs about the fire-box with sufficient rapidity without allowing the movement from the inlet to be too direct. The plate is high enough to give an upward turn to the water as it flows back, and by the time it has passed over the top it is warm enough to pass into the water-legs without injury to the plates or stay-bolts by undue cooling.

GAME APPARATUS.—Dormer Walsh, S. F., assignor of one-half to W. I. Davis. No. 457,018. Dated Aug. 4, 1891. This is a novel game to be played by two or more competitors. The apparatus consists of a table or cloth subdivided and having a central pit with an inclined surface leading upward thereto. Disks with numbers or characters are placed upon the table outside of the pit. Elastic cords are used having one end fixed to a supporting stand or frame and a ball is fixed to the other end, so that the balls may be used to shoot at the disks and impel them into the central pit. Each player endeavors to force as many of his disks into the central pit as possible and the amount of the figures upon the disks will determine his position in the game. The game may be played in many different ways, the most suitable being to

allow each player to shoot in turn and have each shot count as a shot whether a hit be made or not.

LAWN SPRINKLER.—John S. Woolsey, San Jose. No. 457,099. Dated Aug. 4, 1891. In this machine the direct action of the water upon certain floats within the rotary head, in addition to the reactionary force of the arms, causes the sprinkler to rotate with a less head of water than any form depending simply upon reactionary force, while the water will be thrown correspondingly farther.

Mining Share Market.

Comstock mining shares the past week were made quite active through cross-orders, so as to entrap the monied public, but it is not at all likely that the pools' efforts will be crowned with success, for bitter outside experience since the "Bonanza Firm" stopped active operations in the market, has taught them that the mines have been worked in the interest of a few persons, who, through accident or otherwise, obtained control of several mines for looting while making false deals in stocks to catch the unwary with assessments. Two of the "Bonanza Firm" have passed away, but two still remain, Senator Fair and Col. Mackay. The former appears to be engrossed in other pursuits, but the latter every little while returns to his first love, and when he does and gives strict personal attention to the mines in which he is reputed to be largely interested, he institutes some kind of reformatory work in the interest of outside shareholders. In 1886 he had the Jones' lease of Con. Virginia broken, and was mainly instrumental in showing up ore which paid regular dividends for many months. From that time up to a few days ago Col. Mackay has not apparently given much attention to the workings of his particular mines, but commencing with this month he is in active charge of them, and all reliable information points with unerring certainty that good results will follow. While this will unquestionably result, yet the monied public will hardly be drawn into dealing in the market until the serious charges preferred by the Mining Stock Association through the press in this State, and also at the East, are disproved, or else such reformations made in the mining and the milling of ore so as to conform to the laws of this State, which, briefly stated, are the making public of mine assays of all ore taken out, and from which levels, and all information of work being done in the mines, besides all ore run into, its assay, width, etc. Of course this also covers the honest milling of ores.

It is only reasonable to conclude that, judging from Col. Mackay's public record, this law has escaped his notice, and now that his attention is cited to it, he will give to it that attention, that keen sense of justice and right for which he is noted, and in doing so he will have the laws conformed to, so far as the official reports and the working of the mines are concerned. There is another thing the Mining Stock Association has openly charged, viz., that in milling ore, the bulk and the richest part is run off into slimes, etc., which are confiscated by a reported mill ring. These charges have never been refuted, and, so far as we know, no effort made to correct the abuse. Would it not be in the right direction for Col. Mackay to look into these charges—not only this, but have turned over the slimes, concentrators, etc., to be worked for the benefit of shareholders, and out, as heretofore, for mill-owners' benefit? He might also go still further, so as to disarm criticism. The miners might lease or buy the mills for their own use. With these abuses corrected, there will be no further necessity for an organization to fight for needed reforms. The past will be buried, and all join in the onward progress toward right and justice.

The following resolution was adopted by directors of West Con. Va. and Cal. Mining Co., July 29, 1891: It has been reported and is believed that the Con. Va. and California Mining Co. is now and for a long time heretofore has been running drifts into and extracting large and valuable quantities of ore out of the ledge belonging to this company without the consent of this company, and have applied the proceeds thereof to its own use. Be it

Resolved, That the president of this corporation be instructed to take all necessary steps to protect the property of this company, and to employ attorneys, and institute, in the name of the company, any and all proceedings necessary for the protection of the interest of the company, and particularly to take such steps as are necessary to procure a survey of the mine of the said Con. California and Virginia Mining Co. to ascertain the truth or falsity of said reports.

The share market opened this (Thursday) morning strong, but as yet very little interest is taken in the moves by outsiders. It looks as if the market will go higher, but of course breaks or setbacks must be expected, so as to induce trading. In outside shares, there is an entire absence of vitality. They appear to be orphans, no one willing to either father or mother them for a deal.

News from the Comstock mines is confirmatory of more energetic work, some in the right direction, but the most appears to be done to kill time and eat up assessments. Sierra Nevada is about ready to commence active operations to open up its grounds to the west, through the Kenosha tunnel. Good results are looked for. In Union, Mexican and Ophir, interesting and important work is being done. Con. Virginia is closely watched by dealers. Reports of improvements are afloat, which partially confirm what we have heretofore said. To a short time, full confirmation will come to hand. There is a growing belief that in Best and Belcher, a strike ought to be made within the next three or four weeks. Official and private advices from Hale and Norcross and Savage grow more interesting. In Chollar, on the 1100-foot level, the crosscut was not run far enough to cut the west ledge; but a small vein, four feet wide and assaying, so reported, about \$700, was passed through. In Potosi and perhaps in Bullion, it is claimed that west crosscuts have been started. If this is so, they ought, unless work is stopped, tap the lode lying to the west, which is rich in gold. The Milton mine, lying to the west, was worked in early days under Col. Mackay's superintendency, and very rich ore taken out. If they should happen to strike the downward continuation of the lode, quite a surprise would be in store for dealers. In Crown Point, work has been resumed to the west crosscut on the 500-foot level. In other gold hill mines, important work is under way, as are more assessments on the way.

MECHANICAL PROGRESS.

Flame Contact.

Some three years ago Mr. Thomas Fletcher, of Warrington, England, made a series of very interesting experiments, which showed in a most unmistakable manner, that notwithstanding when the most intense flame of holler furnace, or even blow pipe flame, was urged against the surface of any vessel containing water, there was always existing, between the flame and the surface of the vessel, an impenetrable cold zone or space. This extraordinary fact was quite new and unexpected, and is of the utmost interest and importance to steam-heaters and holler-makers. It was shown that a paper label will remain on the bottom of a tin or copper kettle placed on a sharp fire, until by drying, it gradually becomes loosened, and loses its contact with the metal, and so becomes burnt. Care, of course, must be taken that the paper and paste must be very thin, and the latter perfectly dry. Gnm will not answer, as it will swell, rise up and burn.

The important problem to be solved, is to discover what the actual temperature of this cool and flameless zone is, and whether this practically wet blanket can be removed. Efforts to remove it have been partially successful by the use of projecting studs, or webs of definite proportions. Experiments have shown that that flame contact can be made with the ends of copper rods or wires, four diameters in length, made to pass through a water-containing vessel into actual contact with water within. Paper placed upon the outer ends of such wires is soon charred. It has further been proved that the surface of the rods so presented to the action of flames is about six times as effective as the same area of surface on a holler or holler tube.

It has moreover been quite satisfactorily shown that the evaporating power of any properly proportioned studded or ribbed plate has no limit except the practical one of removing the steam quick enough to prevent it lifting the water bodily out of the boiler.

It was also shown in these experiments that not only the maximum temperature can be determined by the presence or absence of charring of known organic substances, but also the thickness or depth of the cold zone can be measured by using paper of different thicknesses pasted to the surface of the vessel. When the paper is thicker than the depth of the cold zone, the surface is charred or completely burnt to an invariable depth by each source of heat; but if this charred surface is cleared off, the under part will be found perfectly white and clean, and on again directing the flame on this clean surface, it remains untouched.

The experimenter, Mr. Fletcher, further says: "The cold zone, although impassable by flame, is powerless to resist the carrying of heat through it by solid bodies, and while the blow-pipe flame is being directed on the paper without the slightest effect, a wire passing through the flame and touching the paper will burn it instantly and completely, although the actual temperature of the wire must of necessity be far below that of the blow-pipe flame."

The extraordinary part of the whole series of experiments seems to be the existence of a zone of cold against all surfaces of metal having water behind them, this space being, to radiate heat and flame, almost as impenetrable as the metal itself is to the water. Some heat certainly does pass, or the water would never boil; but the quantity which does make its way through is very trifling as compared with what would pass, and, in fact, what does pass under such conditions as permit of direct flame contact with the metal.

The result of these experiments does not fit the ordinary accepted theories of radiation and absorption of heat. The fact is that the high temperature stops suddenly at a very clearly defined distance, the division line being sharply drawn. It cannot be said that the heat is absorbed at a sufficient speed to produce this cold zone, because, as a matter of fact, the heat rebounds and is dissipated, to a large extent, sideways, and this rebound takes place at an invariable distance from the vessel, irrespective of the angle at which the flame is driven, and depending only on the force of impact of the flame. If we could imagine the surface of the vessel covered with a layer of elastic material which is compressed by a torrent of small shot driven steadily against it, we get a mechanical representation of the actual state of things between a flame and a cold vessel, additional force of impact reducing the thickness of the elastic layer, but being powerless to annihilate it."

These experiments go far to account for the small amount of work actually realized from the combustion of fuel under a holler. The small results thus obtained have even been a problem, unaccountable by any rational theory of radiation or waste of heat in any other hitherto obvious manner. If an actual contact of flame with the surface of a holler, without any intermediate cool zone, can increase the work six times, as above stated, inventors have an economic problem of the greatest value to work upon.

The experiment of inserting wire rods was made by first drilling holes through a copper vessel and inserting therein wire rods so that they depended four diameters below the outer surface of the vessel, and flattened down with a broad head like a rivet, nearly level with the

inside surface. The theory connected with the utility of these rods is as follows: The lower ends of the rods, not being in close communication with the water, can, and do attain a temperature sufficiently high to admit of direct flame contact, and as their efficiency, like that of the water surface, depends on the difference between their own temperature and that of the source of heat in absolute contact with them. Thus a far greater duty must be obtained for such surface. The heat of the fuel is thus utilized to a much greater extent than by the imperfect flame contact with the ordinary boiler surface.

Of course there are drawbacks connected with the use of rods as described. Says the experimenter:

"To put such rods in a holler-plate necessitates the plate being drilled all over with holes, causing a dangerous source of weakness, as the rods cannot be used as stays; further than this, they would render really efficient examination a matter of extreme difficulty, and would be liable to give rise to frequent and almost innumerable leakages; but there is, fortunately, a very simple way to overcome this difficulty. I have found that rods or points, such as I have described, are not necessary, and that the same results can be obtained by webs or angle-ribs rolled in the plates. My experiments in this direction are not complete, and at present they tend to the conclusion that circular webs, which would be of the greatest efficiency in strengthening the flues, are not so efficient for heating as webs running lengthways with the flue, and in a line with the direction of the flame."

LEAD BURNING.—A correspondent of the *American Machinist* furnishes that journal with the following instructions on the very difficult art of "lead burning": "The art of lead burning seems to be very closely guarded, and few are taught it; in fact, it is made a sort of family affair, being handed down from father to son, through several generations. The process which I shall describe is for through burning, and not surface burning. The flame used is hydrogen gas mixed with air under pressure. This melts the lead on each side of the seam, and forms one piece of the sheets. Strips of lead are used instead of solder. To burn flat seams, such as bottoms of tanks, floors, etc., butt the sheets closely together, and under the joint place a strip of common brown or grocer's paper, about two inches wide, scrape bright for one-fourth of an inch on each side of seam, also scrape the piece of scrap lead, which should be about one foot long, one-half inch wide, and say, one-eighth inch thick, or the thickness of the sheet to be burned. Regulate the flame to the weight of the lead and let it play directly upon the seam, at the same time hold the piece of scrap in the flame, resting it on the lead, just at the seam; when the melt takes place, quickly withdraw the flame, and allow to cool down; when sufficiently set, commence again at a point just in advance of the solid seam. By these repeated meltings and coolings you will form a lead to lead joint, which is as strong as any other part of the sheet. To burn upright seams, which is the most difficult, commence at the bottom and burn upward, melting and cooling, as in the case of floor seams. When an upright joint is finished, it looks just as if it were shingled with round disks of lead, about the size of a cent, with about one-half the diameter of the disk to the weather."

The above writer describes a very carefully constructed apparatus which should be used, but which cannot be made intelligible without illustrations.

AMERICAN LOCOMOTIVES.—We have already made reference to the fact, so complimentary to American locomotive builders, that the government of New South Wales has recently ordered 27 locomotives from the Baldwin locomotive works of Pennsylvania. The *Australian-American* gives the reason for the preference of that government for American over English-built locomotives. That journal says: "American locomotives have had no easy road to travel in Australia, thanks to English opposition in the office, at the shops, and even in the cab. The order in question goes to a Philadelphia firm, and is based on the conceded advantage of American-built locomotives for climbing heavy grades and turning sharp curves. The freight locomotives are of the heaviest and strongest build, and with tender attached, will each weigh from 80 to 85 tons. The cost of the American-made locomotive is from \$8000 to \$12,000. Those destined for Australia will be sold to the government there for about \$10,000 apiece, the sale aggregating over a quarter of a million dollars. It is a "rush" order, and a special steamer will be ready to take the engines out when complete." This large order with the reasons for its being given to American builders, may be considered one of the greatest triumphs of American mechanical skill. It may be added here 12 locomotives were recently built for export to South America.

SINGULAR BUSINESS ENTERPRISE.—It is said that a steamer built at Bay City, Michigan, for the Pacific Coast trade, is now on her way to the ocean, via the St. Lawrence river. She is a steel ship of 2512 gross tonnage, with 1300 h. p. engines. Questions of cost largely figured in the selection of a building place on the Great Lakes for the vessel, and it is said that the Michigan builders stood ready to deliver her on the coast at a figure below the estimates of firms which launch their vessels in salt

water. Other vessels, it is announced, will follow her and will be dispatched to the Pacific Coast.

SCIENTIFIC PROGRESS.

Properties of Color.

The sun is, doubtless, the origin of all colors, as colors, with all their variations, are due to light. To us, color would have no existence if the eye and light did not exist to make it. Sound has no more to do with the eye than color has with the ear. Thus we see that both sound and color are the results of their conditions. Reflection is to light what echo is to sound, so that when light is reflected from visible bodies, it paints the image of those bodies upon the retina of the eye; thus we see them. In the autumnal season when we look across the landscape to the bordering forest with its green and yellow tinted foliage, how impressed we are with the transformation scene! At noon it is light and dazzling; in the evening, when the sun is lowering, it is somber and mellow. These effects are caused by the varying shades of light.

Newton was the first to discover the analysis of white light. He decomposed solar light, or rather common daylight, by means of a prism, or triangular piece of glass. To do this, he made a small, round hole in the window shutter of a darkened room. The aperture was large enough to admit of the necessary ray of light, which, passing through the prism, threw a prismatic spectrum on the blackboard placed to receive it. This spectrum was really an artificial rainbow, or solar spectrum. The solar spectrum is caused by suspended water in the atmosphere, or a rain-shower falling between the sun and the dark cloud which forms the background of the rainbow. The rain-shower acts as a prism. By means of a prism, Newton found that white light was capable of being broken up into its component parts, each part being a constituent of white light.

From such experiments it has been inferred that the sun's light is not homogeneous, but that it consisted of seven cardinal colors. These seven colors have different forms of refrangibility—that is, the prism through which the light passes bends some of the colors to a greater extent than others, giving each its respective place in the spectrum. From bottom to top, colors range as follows: Red, orange, yellow, green, blue, indigo and violet. Green, you will perceive, is in the center, and for that reason, perhaps, is the most universally agreeable to the eye.

From the arrangement of the colors, however, we see that red has the least degree of refrangibility, and violet the greatest, while green has the intermediate. Through the round aperture, used by Newton for the transmission of light, it was found that the colors overlapped or intercepted each other; but a German scientist, Kirohoff, experimented with a slit in the shutter, which he found gave a distinct and definite spectrum, free from the interceptions caused by the round aperture, and thus the color theory was definitely settled.

Natural bodies, such as flowers, plants, textile materials and all other bodies, of course, possess the power of extinguishing or absorbing some of the colors which enter them, reflecting others from their surfaces. This property of absorption is selective, and decides the color of the said plants and flowers, as also of painted or dyed materials. When the light which enters a body is wholly absorbed, the body is black, none of the seven colors being reflected, either combined or separate. The combined colors, when reflected in compounds, give tints which differ from the cardinal colors, such as pink and magenta, the latter being so called from its being discovered in the year of the battle of Magenta, 1859. A body which absorbs all the light waves equally, but not totally, is gray, while a body which absorbs all the waves unequally is tinted with various colors, hence the vast variety in the color of flowers. A body which gives back all the waves, without absorbing any, is white. Those constituents of white light, which bodies return to the eye, constitute their colors. A body placed in a light, which it is incompetent to transmit, appears black, however intense the illumination.

A stick of red sealing-wax, when placed in the vivid green of the spectrum, is perfectly black, and red cloth on which the red of the spectrum is permitted to fall, shows its color vividly, but appears black beyond that position. Indigo is largely used in dyeing. The indigo plant could itself be largely used for that purpose, but from 200 to 250 pounds of it would be required to produce the effect of a single pound of prepared indigo. The most important of red colors are produced from cochineal, a small insect found chiefly in Mexico, and from madder, the root of a certain plant, the former being used for woolen and the latter for cotton.

Indigo is distinguished from nearly all other coloring matter by its complete insolubility *per se* in water. Alcohol, methylated spirits and the like have to be resorted to as solvents, as indigo is largely used in dyeing. Let wool or silk be immersed at boiling temperature, in decoctions of any of the best known natural dyestuffs, such as cochineal, logwood, madder or quercitron bark, etc., and then washed in water, it will be found that the fibers of the

material are merely discolored or stained of no definite shade, hence the use of mordants.

The term "mordant" is found in Latin and Italian manuscripts of the twelfth and thirteenth centuries, as the name of an adhesive composition by the means of which gold leaf was attached to wood, marble and the like, but was latterly used for the decoctions used to give permanence to color in clothing materials. The chief mordants used in dyeing are salts of aluminium, of iron, tin, copper and a few other metals.

The purple dye is spoken of from earliest history, and the priests were distinguished from common folks by the colors of their garments, and other favorites wore coats of many colors, such as the Joseph who was sold into Egypt. We also learn from the writings of Pliny that the priests of Isis and Osiris in Egypt wore garments ornamented with purple trimmings, the colors of which were derived from a certain shellfish. By the aid of Pliny's records, this shellfish has been rediscovered, but the color derived from it is said not to be very brilliant. The ancients, however, may have had a better method of preparing it, for some of the colored threads found among the wrappings of Egyptian mummies distinctly show that the ancients of Egypt excelled in imparting colors to woven materials, and doubtless the Hebrews derived their superior knowledge of dyeing wool from the Egyptians.—*Fiber and Fabric.*

THE AGE OF MAN.—When was man first placed on earth? No one can answer that question. Hugh Miller says that man's habit of hurrying his dead out of sight makes it very easy to be mistaken on that point; for, because of burial, men's bones may be found among the animals that have lain in the earth for ages. There is one thing, however, that gives us an inkling of when he came. Certain tools, that only man could have made, have been found hurled in caves, in peat beds and in the bottom of lakes. Often these are covered by layers of rock, and by calculating how long it took to make the layers, a guess can be made as to when the tools were put there. Still it is only a guess, and no one pretends to regard that question as settled, because under some conditions the layers would be made much faster than under others; but the bones of certain animals, the mammoth and other great creatures of that time, which have long since died, have been found with these tools. By calculating in what ages these animals lived, and how long it takes a race of animals to die out, a surer result can be arrived at. In a cave in England, buried under a limestone layer from 1 to 15 inches thick, tools have been found mingled with the bones of elephants, tigers, rhinoceroses and hyenas, which roamed over that country thousands and thousands of years ago. The peat hogs of what is now Denmark and Scandinavia are filled with stone tools. Some have been found in beds of gravel, underlying peat which is certainly 7000 years old. This seems to show that man must have dwelt on earth at least as many years ago.—*St. Nicholas.*

THE MYSTERY OF THE STARS.—The fixed stars (so called) are not fixed, at least we know that great numbers of them have motions, which can be measured and defined by modern telescopes; hence it is naturally inferred that all are in motion. Motion seems to be one of the universal laws of nature. The moon revolves around the earth, and the earth, carrying the moon with it, revolves around the sun. Just so in a triple-star system we behold one star revolving around another, and the two together revolving around a third. The resemblance goes even further, for the smallest star of the three revolves around the second in size, and that in its turn around the largest. Stars are not only revolving around other stars, but they also have secondary motions through space. Many stars are approaching our solar system, others are moving away from it, and both motions are in various directions. Our own sun, with its attendant planets and their satellites, are moving in an apparently direct line through space. The line is apparently direct, but most probably the motion is curvilinear. The mystery of the motions of the stars must forever be an unsolved problem. They can no more be measured than can be the unlimited depths and vastness of space.

WOMEN IN SPECTROSCOPIC ASTRONOMY.—In spectroscopic astronomy, says a contemporary, the eye has been superseded of late to a great extent by the photographic plate, which is now able to recognize fainter impressions than the eye, and register them permanently. The instrument employed is a photographic telescope, with a prism, or a series of prisms, in front of the object glass, the whole mounted like any large telescope, and provided with an accurate driving clock. It has thus become possible to complete, in a comparatively short time, a general survey of the spectra of all the brighter stars of the northern hemisphere, and the survey is now being extended to the southern hemisphere, where it is already well advanced. Whenever the spectrum of a star, thus photographed on a small scale, is found to possess any interesting peculiarity, it is examined with a more powerful instrument, which photographs its spectrum on a much larger scale, and this second photograph is then enlarged again for special study. It is a notable fact that the examination of the Harvard photographs has been made almost entirely by women, who are assistants in the observatory.

GOOD HEALTH.

Apples as Medicine.

Chemically the apple is composed of vegetable fibre, albumen, sugar, gum, chlorophyll, malic acid, gallic acid, lime and much water. Furthermore, the German analysts say that the apple contains a larger percentage of phosphorus than any other fruit or vegetable. This phosphorus is admirably adapted for renewing the essential nervous matter, letholism, of the brain and spinal cord. It is, perhaps, for the same reason, rudely understood, that old Scandinavian traditions represent the apple as the food of the gods, who, when they felt themselves to be growing feeble and infirm, resorted to this fruit for renewing their powers of mind and body.

Also, the acids of the apple are of signal use for men of sedentary habits whose livers are sluggish in action; these acids serving to eliminate from the body noxious matters, which, if retained, would make the brain heavy and dull, or bring about jaundice or skin eruptions and other allied troubles. Some such experience must have led to our custom of eating apple-sauce with roast pork, rich goose, and like dishes. The malic acid of ripe apples, either raw or cooked, will neutralize any excess of obnoxious matter engendered by eating too much meat. It is also the fact that such fresh fruits as the apple, the pear and the plum, when taken ripe and without sugar, diminish the acidity in the stomach rather than provoke it. Their vegetable salts and juices are converted into alkaline carbonates, which tend to counteract acidity. A good ripe raw apple is one of the easiest of vegetable substances for the stomach to deal with, the whole process of its digestion being completed in 85 minutes.

Gerard found that the "pulp of roasted apples mixed in a wine-quart of fair water, and laboured together until it comes to be as apples and ale—which we call lamb-wool—never falleth in certain diseases of the rashes, which myself hath often proved, and gained thereby both cures and credit. The perling of an apple, out somewhat thick, and the inside whereof is laid to hot, burning or running eyes at night, when the party goes to bed; and is tied, or bound to the same, doth help the trouble very speedily, and contrary to expectation—an excellent secret."

A poultice made of rotten apples is of very common use in Lincolnshire for the cure of weak or rheumatic eyes. Likewise, in the Hotel des Invalides, at Paris, an apple poultice is used commonly for inflamed eyes, the apple being roasted and its pulp applied over the eyes without an intervening substance. A modern maxim teaches that "To eat an apple going to bed, the doctor then will beg his bread."—*London Hospital*.

SEASICKNESS.—Some one writes very sensibly upon seasickness, as follows: "Seasickness is a mental malady, in a sense, that is, it can be cured mentally. I have seen a whole mess of seasick persons cured in one minute by an alarm of fire. Sometimes ladies are cured by a steward spilling the soup in their laps. I have several times seen people fall over the rail when 'heaving up,' and when we fished them out of the water no trace of the complaint remained. The claim that it is good for general health is a humbug—a gross humbug. An emetic is a good thing in this time of onrs, when every one eats like a cormorant, and that far seasickness may do some good. Prevent it, you say! Well, in the first place, have nothing to do with doctors or their nostrums. Seasickness is not always alike, but generally begins with acidity of the stomach, and this acidity is the result usually of two factors, liquids and grease. The stomach is the greatest apparatus known for distilling fat acids—don't drink anything and eat no grease. When ill lie on your back, fore and aft ship, and swallow broken ice, slowly. I don't mean at first, but after a few hours when the stomach is sure to be inflamed and hot, while your hands and feet will be cold. When you get the boiler, I mean stomach, cooled off and empty, heef tea, broth if you can get it, cream, are suitable things to fill up on. The only medicine you need is some alkaline to correct acidity; calcined magnesia is best. For solid diet fat pork or old cheese."

MORE DANGEROUS THAN THE TARANTULA.—Truxton Davidson of Mission Valley, Tex., was bitten by a spider, inflicting a painful and dangerous wound. Dr. Boatner was called in great haste to the bedside of the sufferer and by the prompt application of remedies succeeded in relieving him of his pain. There is a small gray spider in this section whose bite is both painful and dangerous, at least two oases within the writer's knowledge having resulted fatally. It is about the size of a man's thumb-nail and may be distinguished by a wavy line of red or yellow that extends from its head down the center of its back the entire length of the creature's body. Its bite is far more dangerous than that of the tarantula or any of the venomous serpents except the rattlesnake. —*Galveston News*.

OLIVE OIL AFTER A BATH.—Any one can add strength and weight to his body by rubbing well with olive oil after a warm bath. Oil baths are particularly beneficial to delicate children.

THE WOOD WORKER.

Speed in Wood-Working Machinery.

A correspondent of the *Manufacturer's Gazette* writes as follows:

There has been a great deal written on this subject, but as it is one which admits of considerable argument, and every man has a right to his opinion, I thought it no harm to express mine, and hope others will follow the example.

The proper speed at which all kinds of machinery, and especially wood-working machinery, should be run is of great importance and concerns both the proprietor and the workman. As to the former, it means the greatest amount of good work in a given time, while considering the wear and tear upon the machine. No one will be foolish enough to think that it is profitable to force a machine to turn out a few dollars, or even cents worth of work, in a day, if by so doing the quality of the work and the condition of the machine are rendered less valuable.

And it is just here that the value of the operative's services and the degree of his skill are manifest. It is necessary that he should be able to judge as to the speed which a machine should be run to do its best work, and yet without strain or damage. If the machine is speeded too low, then it cannot do sufficient work to make its employment profitable.

Now there are certain laws and general principles which govern the speed of a machine for a given work, to do it profitably and economically. There are certain limits beyond which it is neither safe nor profitable to go.

No matter what is claimed by the manufacturer of a certain machine, there is a law which says that all bodies revolving around a common fixed center have a tendency to fly off in a line tangent to that center, and that force increases in proportion as the square of the velocity. Now, in calculating the centrifugal force of a revolving body, the diameter has to be taken at the center of gravity. In the case of regular shaped bodies, such as pulleys, fly-wheels, etc., the center of gravity is found to be very near the outward surface, and is very easily determined, and the centrifugal force may be calculated as follows: Multiply the square of the velocity in feet per second by the weight, and divide the product by 32 times the radius in feet at the center of gravity, which will give the centrifugal force in pounds.

Having ascertained this, it is a very easy matter to calculate the limit of safety at which a given body may be speeded to stand the strain exerted by this force, and in setting up machinery it is all important that these calculations be accurate.

There is too much guess-work in the average shop. Getting a pulley that is about right and near enough is poor policy, and is not only an injury to the machine, but an injustice to the maker, who guarantees it to do a certain amount of work under certain conditions, which cannot be guessed at and give satisfaction.

It is poor policy to employ poor workmen at any time or upon any occasion, but it is positively wasteful and disgraceful to employ a "blacksmith" to set up a new machine, and especially wood-working machinery, which admits of being run at a high rate of speed, but to which there is a limit of endurance and efficiency.

TO SAW TOUGH TIMBER.—All tough timber, when the logs are being sawed into lumber of any kind, whether scantling, boards or planks, will spring badly when a log is sawed in the usual manner, by commencing on one side and working toward the other. In order to avoid this, it is only necessary to saw off a slab or plank alternately from each side, finishing in the middle of the log. We will suppose, for example, that a log of tough timber is to be sawed into scantling of a uniform size. Let the sawing be done by working from one side of the log to the other, and the end of the scantling will be of the desired size, while at the middle some of them will measure one inch broader than at the ends. After the log has been spotted, saw off a slab from one side; then move the log over, and cut a similar slab from the opposite side. Let calculations be made before the second is cut off, so that there will be just so many cuts—no more, no less—allowing for the kerf of every cut. If the log is to be cut into three-inch scantling, for example, saw a three-inch plank from each side until there is a piece 6½ inches thick left in the middle. The kerf of the saw will remove about one-fourth of an inch. When a timber log is sawed in this way, the cuts will be of uniform thickness from end to end. Now turn the log down and saw the outside the other way, in the same manner, and the scantling will not only be straight, but of a uniform size from one end to the other, if the saw be started correctly.

"QUARTERED" OAK is made by sawing the oak log first into quarters, and then laying the round side down and sawing each quarter up into boards. This method of working up the log gives to the boards a peculiar figure in the grain that is lacking in oak prepared in the ordinary way by cutting the whole log up into strips.

USEFUL INFORMATION.

How Gold Is Shipped.

As few people realize the vast bulk of gold coin that is shipped annually from one country to another, and are unacquainted with the manner of shipments, the following from the *American Banker* will be interesting:

The Bank of America is the largest single shipper of gold from New York, and indeed from the United States. Shipments are made in stout kegs, very much like the ordinary beer keg. Every one contains \$50,000 in coin or bar gold. The latter is the favorite of these shipments, since the Government has permitted the Sub-Treasury to exchange coin for bar gold, as coin, in a single million dollar shipment, is liable to loss by abrasion of from eight to 20 ounces, or from \$128 to \$320; while the bars only lose about three-fourths of that value. Where coin is sent, double eagles are preferred. They are put in stout canvas bags, each containing 125 double eagles, or \$5000; and ten bags fill each keg. About the only precaution taken against tampering with kegs is a treatment of kegs' ends technically known as "red taping." Four holes are bored at equal intervals in the projecting rim of the staves above the head. Red tape is run through these, crossing on the keg's head, the ends meeting at the center, where they are sealed to the head by the hardest wax and stamped with the co-signor's name. The average insurance is about \$1500 per \$1,000,000. There is an expense of about \$2 per keg for packing and cartage aboard ship, or \$200 for the same sum and the inevitable loss by abrasion, whatever it may prove to be. The great Wall street firms ship from \$25,000,000 to \$40,000,000 annually. Some of these have for years insured themselves, and assert that the saving has been sufficient to replace a loss of \$1,000,000. These are large figures, but this has become a country of large figures and affairs.

The loss, by abrasion, on every \$1,000,000 in gold coin shipped across the Atlantic is said to be between one and two thousand dollars.

INGENIOUS MAKESHIFTS.—Ingenuity can extemporize the most unusual methods for attaining certain purposes. The Lounger happened into a rolling mill one evening last week and witnessed a novel feat in the beefsteak-broiling line which commended itself from sheer force of ingenuity. On the cooling bed, back of the rolls, lay a pile of red-hot iron which had just been rolled. The "heat" was over, and a brawny "rougher-up" began to prepare his supper. In a jiffy he had slipped a beefsteak on the hot iron, and by quickly turning it as often as once in five seconds, he broiled that steak to a nicety. This was equal to the makeshift of a hot-carrier at work on a Dearborn street building. When the noon hour struck, he rammed a handful of lime in a hole scooped in the sand, and sprinkling it with water, placed his dinner-pail over his flameless fire, securing a warm dinner and the open-eyed admiration of his amused spectators. —*Chicago News*.

TO PRODUCE GROUND GLASS.—The following process to produce ground glass has been recommended to me by a professional photographer. A cup is filled up to one-half with water, to which some emery powder is added. Stir well, allow to stand for about five minutes, and decant into another cup. Allow to stand again for five minutes, and decant the fluid into a third cup. In each of the cups remains a sediment of emery powder of various degrees of granularity. Take a well-cleaned glass plate, and commence to grind it with the coarsest grain; proceed with the grain of the second cup, and finish with the finest one. A semi-transparent glass plate of exceeding fineness is obtained by this method. —*Photo. News*.

THE PLEURO-PNEUMONIA IN ENGLAND.—The outbreak of this disease in the herds of the East Riding and the action taken by the Agricultural Department have caused quite a stir among the agriculturists of Yorkshire. The number of animals ordered to be slaughtered is 170. The slaughter is expected to occupy ten days in all, and the value of the beasts destroyed and to be destroyed is estimated at fully \$15,000, which will be paid by the Agricultural Department of the Privy Council. The outbreak of the malady is on a scale unprecedented in so small an area.

MONUMENTAL STRUCTURES.—The Boston cemeteries are said to contain no monument valued at over \$5000. Greenwood, New York's city of the dead, has memorials whose cost runs up into the hundreds of thousands.

THE LARGEST DEPOSIT OF SULPHUR on this continent is said to have been discovered in the Cocopah mountains, 75 miles southwest of Yuma. It is 1100 feet long, 60 feet wide and 40 feet through.

AN IMPROVED CASH REGISTER.—A cash register has been invented which, it is said, prints numbers and cuts off a check in one motion. The amount is, of course, registered at the same clock.

NASTURTIUMS PICKLED.—As soon as the blossoms are off, gather the little knobs; put them into cold water with some salt; move them about once a day for three successive

days; make a cold pickle of white-wine vinegar, eschalot, pepper, cloves, mace, nutmeg out in quarters and horse radish. Put the nasturtium buds into this pickle.

STEAM BOILER NOTES

KEEPING UP STEAM OVER NIGHT.—An engineer has been telling a contemporary how to keep up steam in a boiler over night without banking. First, the damper is closed tightly and ashes drawn to the ash-pit door, making it air tight. Then the smoke-box door is opened a trifle, the result being that the engineer had 15 to 25 pounds pressure in the morning. With a setting that is not full of leaks, it should be easy enough to keep up pressure over night without any fuss, and if not, there is some leak somewhere that should be attended to. The leak may be of steam, through faulty connections or in a cracked setting, letting the cold air come in contact with the boiler. Then some engineers have an idea that the top of the boiler should not be covered, and here is an avenue for the heat to escape. I have let the fire under a boiler go out early Saturday afternoon, and on Sunday afternoon have found 25 pounds pressure, and nothing was done but close the damper, furnace door and ash-pit door. The heat practices is to bank the fire, but when this is done, there is more fear of a pressure too high than otherwise. Any one who has a steam-pressure recorder will note that the pressure runs very high during the night, and passing through any of the city streets late at night, the hiss of steam escaping from safety valves is plainly heard, and leads to the suggestion that some may be in condition less responsive to the excess in the pressure allowed.

LIMITS OF STEAM EXPANSION.—The following extract from a circular issued by the English builders of a high-speed engine said to run satisfactorily at 700 revolutions per minute and to develop 200 horse-power, is interesting, since it attempts to confine the use of double and triple expansion to certain limits: If the boiler pressure always exceeds 70 pounds, it is worth while to use a compound engine; if as high as 150 pounds, a triple-expansion engine. If the engine exhausts into a vacuum, the corresponding pressure will be about one-fourth lower. The extent to which the steam may be expanded with advantage depends upon the boiler pressure. If the expansion is carried to more than a certain number of volumes, it is advantageous to divide it into two stages, i. e., to expand partly in a high-pressure or small cylinder or cylinders and partly in a low-pressure or large cylinder or cylinders. With still greater expansion, it is worth while to expand in three stages, i. e., in three successive cylinders of increasing diameter, and so on. But, although there are great practical and economic advantages in the system of expansion in successive stages, there is no essential difference in principle between expanding, say eight times, in a series of three cylinders, with comparatively late cut off in the first or smallest one, and expanding eight times in the largest of the three only, with the steam admitted to it direct and out off at one-eighth stroke.

MANAGING SAFETY VALVES.—An engineer, speaking of neglected safety valves, said: "Safety valves that stick will stick even though tried every day, if they are simply lifted and dropped to the old place on the seat again. If a boiler should be found with an excessively high pressure, it would be one of the worst things to do to start the safety valve from its seat unless extra weight was added, for should the valve once start, it would so suddenly relieve the boiler of such a volume of steam as would cause a rush of water to the opening, and by a blow just the same as in water hammer rupture the boiler. Such a condition is very possible to occur of itself when a safety valve sticks. The valve holds the pressure, that gets higher and higher, until so high that the safety valve does give way and allows so much steam to escape that the sudden changing of conditions sets the water in motion, and an explosion is the result."

IN PACKING the stuffing boxes of piston rods and valve rods, the utmost care should be taken to put in the packing evenly, so that the steam may be prevented from seeping without the necessity of screwing down the glands so tightly as to interfere with the free movement of the rods. The packing should be changed as often as may be necessary to prevent it from becoming hard and gritty, as keeping it too long in use may be the means of grooving or creating the rods, thereby occasioning leakage and consequent trouble.

CYLINDER LUBRICANT.—Too many engineers behind the times still use tallow as a cylinder lubricant, and by so doing run a great risk of eventually destroying the engine, as the several fatty acids, stearic, oleic, margaric, etc., of which tallow is composed are almost sure to eat out the valve seat, piston rings and other parts of the cylinder. Some good mineral oil should be used, which is known to have a reputation.

A HIGH PRESSURE ENGINE runs by the direct pressure of the steam only. In a low-pressure engine, the steam is condensed with water or otherwise, and a vacuum formed in front of the piston, adding from 13 to 14 pounds per square inch to the power of the piston.



A. T. DEWEY.

W. B. EWER.

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G. H. STRONG.

SAN FRANCISCO:

Saturday, August 15, 1891.

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Passing Events.

The Pine Nut excitement, Nevada, still continues, but as yet little is known of the veins. There is only one claim thus far that shows large prospects, and its owner is very mysterious about it, prohibiting all examination by other miners. He claims to have taken out several thousand dollars. Numbers of prospectors are working in the district testing other prospects.

The Golden Gate river mine, on the Feather, is now ready for operation, the river having been turned into the flume. The pumps are being rigged to remove the pools in the river bed, and in a very short time they will know whether the river bed is as rich as supposed. This is an exceptionally good season for river mining, the waters in the streams being very low.

A prominent mining company in this State has commenced suit against certain interior merchants for buying gold alleged to have been stolen from the mine by miners working in it. This is a new move and will be apt to make gold-dust buyers careful in their purchases. Suits have been commenced also against some of the miners.

The reports of earthquakes in Lower California appear to be greatly exaggerated. Some severe shocks have been felt in the region about the head of the Gulf, but no great damage has been done.

Early Favors Appreciated.

Subscription receipts have been slow in June and July. Now, as the season has advanced, will not our subscribers, more or less in arrears, pay up to date and a year in advance? We can give them all the better issues for prompt payment, and will thank them besides. Try and get your neighbor to take our paper, and we will give him cause to rejoice at its many good visits.

Expenses Per Ton of Ore.

The Alaska (Treadwell) gold mine, Douglas island, Alaska, which we mentioned last week as having the largest gold-milling plant in the world, produces and mills 600 tons of ore per day. During the year, ending May 31st, the company's receipts were \$790,001.71, of which \$18,977.19 was from the store. The ore crushed aggregated 220,686 tons, yielding \$3.58 per ton. Operating expenses subtracted, the net revenue was \$418,208.90, of which \$200,000 was paid out in dividends.

Some of the figures from the report of this company are of general interest to miners. The expenses per ton of ore were divided as follows: Mining, 220,686 tons—labor, \$0.4555; supplies, \$0.2495; total, \$0.7050. Milling 220,686 tons of ore, 5,777 tons of concentrates being saved—labor, \$0.1940; supplies, \$0.2266; total, \$0.4206. Chlorination of concentrates—labor, \$5.0312; supplies, \$3.9852; total, \$9.0164 or \$0.2193 per ton of ore. General expenses, including salaries, interest, exchange, insurance, hospital account, etc., \$0.0804. San Francisco office expenses, \$0.0239. Bullion charges, \$0.0528; total operating cost, \$1.5020. Legal and other expenses of incorporation of company, \$0.0286 per ton of ore; construction account, \$0.1540 per ton of ore; total cost of operating and construction, \$1.6564. The yield per ton of ore was \$3.58, the net profit being \$1.90. In 1885, from August to December, inclusive, the ore yielded \$7.02 per ton. In 1886 the average yield was \$4.03; in 1887, \$4.40; in 1888, \$3.55; in 1889, \$3.04, and in 1890, \$3.58.

This shows that the cost of mining was 70 cents, and of milling 42 cents per ton. The total operating cost was \$1.50 per ton of ore. Including these with construction and operating expenses, the cost was such as to permit a profit of \$1.90 per ton on ore which yielded \$3.58 per ton. This shows cheap working and proves what can be done with low-grade ore. It was no small batch of ore either, but over 220,000 tons were mined and worked in the year.

The North Fork District.

When the boundaries of the Yosemite Reservation were recently enlarged to preserve the timber and maintain the water supply, the lines took in the North Fork mining district, where prospectors were at work before the last Act of Congress was passed. There are no natural curiosities or wonders in the district, but it is supposed to contain valuable mineral ground. Miners who have attempted to work on the ground have been driven off by U. S. troops in charge of the reservation.

The miners are endeavoring to have the laws amended so the boundaries of the reservation will exclude the mining district. They have applied to the State Mining Bureau to endorse the appeal to Congress to change the law. State Mineralogist Ireland will send an expert to examine into the mineral character of the region, and if the facts are as represented, will endorse the appeal.

It is not at all probable, however, that Congress will change the law establishing the boundaries of the reservation because the miners want to work ground there. The Government departments generally, as well as the Government courts, seem to be unfavorable to the mining industry, and pay little attention to the demands of miners. Railroads, capitalists and agriculturists have money influence or votes, and are apt to get what they want from Congress. The miners have no association or alliance of any kind to enforce attention, so their demands meet with little favor. As to Mining-Bureau influence, it had a very close call to get recognition from its own State Legislature, and what it can do with Congress is problematical. A good, smart, influential Representative or Senator from this State, with the slightest interest in the miner or mining industry, might straighten the matter out favorably, but we have little hopes under present conditions. The miner need expect little aid from either our Legislatures or Congress.

Milling Comstock Ores.

Official figures show that from the Comstock mines in the last quarter, 56,430 tons of ore were extracted. The gross yield was \$934,274; cost of extraction, \$464,274; cost of transportation and reduction, \$365,244. The Cons. Cal. and Virginia made a profit of \$218,049 from 25,940 tons of ore, and the other eight mines made an aggregate loss of \$113,440 in the quarter. Savage lost \$6931 in 7030 tons of ore; Ohollar lost \$19,284 on 6930 tons of ore; Overman, \$33,790 on 7813 tons of ore; Yellow Jacket, \$21,434 on 4973 tons; Justice, \$11,511 on 1139 tons of ore. It cost the Challenge \$11,980 to extract 431 tons of ore, the gross yield of which was only \$6499, and they paid \$3020 for working it. Confidence got out 780 tons, which yielded \$11,924, but it cost \$13,032 to extract it, and \$5460 to pay transportation and reduction. Justice took out 1139 tons at a cost of extraction of \$20,649, and the gross yield was \$17,113 and \$7975 for reduction and transportation.

The Cons. California and Virginia paid a hullion tax of \$10,575 to the State of Nevada, but none of the others had to pay any tax, there being no profit. For the first quarter of the year, these same mines, with the addition of Crown Point, produced 44,044 tons of ore, valued at \$652,732, or an average of \$14.82 per ton.

For the fiscal year ending June 30, 1891, 15 Comstock mines produced 236,599 tons of ore valued at an average of \$14.50 per ton, or \$3,430,621 in bullion. Among these, Cons. Cal. and Va. produced 89,429 tons of ore of an average value of \$17.25 per ton, equal in hullion to \$1,543,311. For the preceding year, the average of 266,097 tons of ore was \$15.90 from all the mines; and in the year before that, the average of 266,611 tons was \$19.21 per ton. The average for the last fiscal year was the lowest in five years.

With one exception none of these mines have been paying dividends, or even expenses, with the grade of ore extracted. Most of them have been losing money right along. The high cost of mining incident to deep work, prospecting operations, etc., and the extreme cost of hauling ore and milling it prevent any profit being made. As a contrast to this may be mentioned, the figures given elsewhere in this issue of the cheap work being done in the Alaska gold mine, where they are paying dividends on ore worth only \$3.58 per ton.

The product of the Daly mine, Utah, for the first seven months of 1891 was as follows: \$220,195.44 from the sale of sulphides, and \$135,543.65 from ore sales. Seven regular monthly dividends of 25 cents each per share, aggregating \$262,500, have been paid the present year. Total dividends to date, 53, aggregating \$2,025,000.

The product of the Ontario mine, Utah, for the first seven months of 1891, has been as follows: 533,540 ounces of bullion, and \$376,169.60 from ore sales. Regular dividends have been paid each month of 50 cents per share, aggregating \$525,000. Total dividends to date, 182, making a grand total of \$12,025,000.

NEW BAG MILL AT THE PRISON.—At the last meeting of the State Prison Directors, plans, with a synopsis of specifications for the proposed jute-mill at San Quentin were submitted by P. A. Humbert, who advises the erection of a mill of 200 looms, costing \$139,645. The plans were approved.

WM. A. BOLINGER, a pioneer miner and merchant, died at Independence, Inyo Co., two weeks ago. He was formerly engaged in extensive quartz-mining enterprises in Plumas county, and more recently in Inyo county.

THE assessed valuation of the mining claims of the Sierra Buttes Co., at Johnstown, Plumas county, were reduced this year by the assessor \$90,000 below last year's estimate.

CALISTOGA quoksilver mines shipped 807 flasks last month—an exceptionally large amount. Judging from shipments, the mines are in a flourishing condition.

New Excavating Machinery.

A Successful California Invention.

The contract for the excavation of the main canal of the Central Irrigation District, from Sacramento river to Stony creek (a distance of about six miles), was let to the San Francisco Bridge Co. on October 10, 1889. This contract involved the excavation of about 1,250,000 cubic yards, this section having an average depth of about 15 feet, while in some places it is 19 feet 6 inches deep, with a bottom width of 60 feet and top width of about 100 feet.

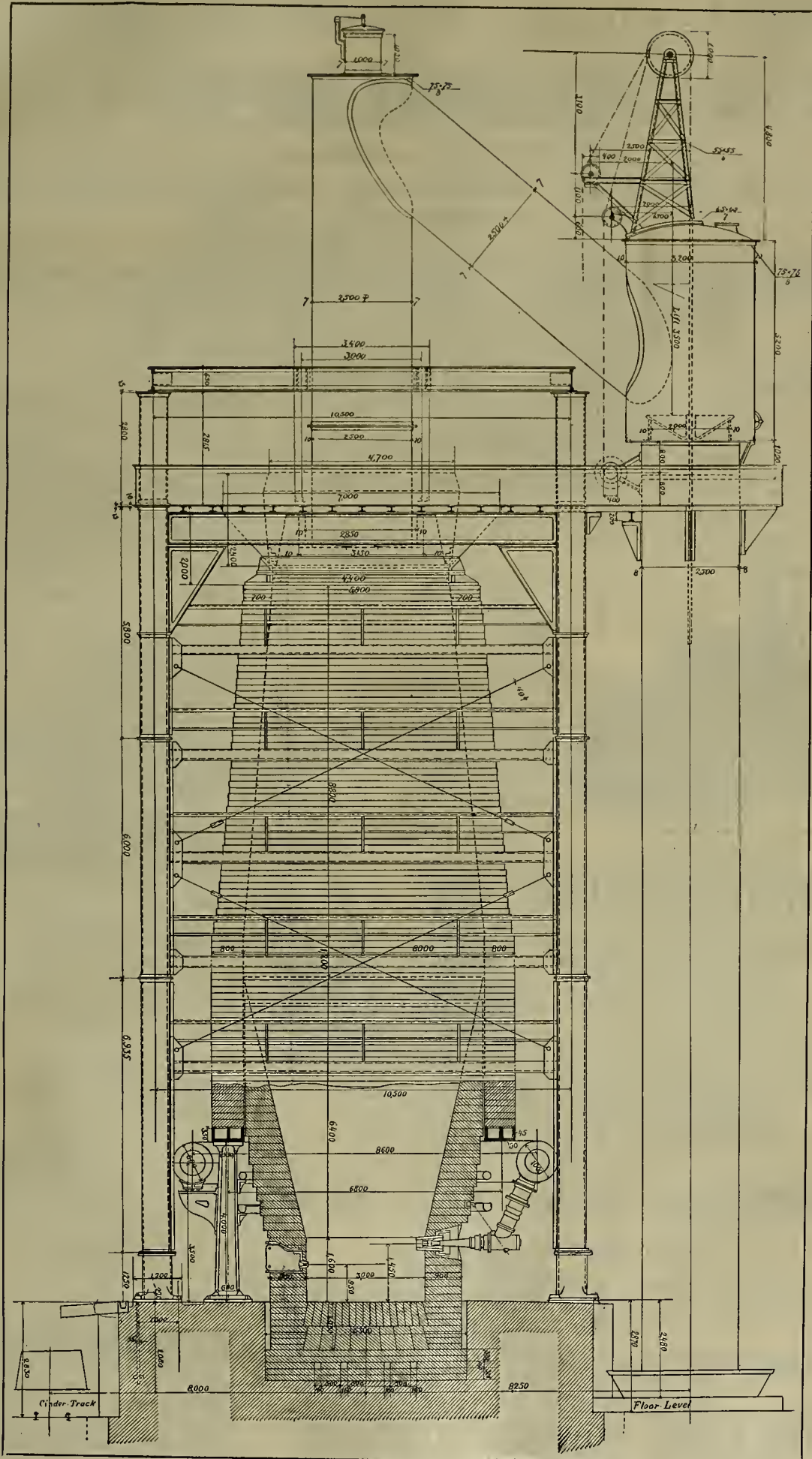
The contract price was 17½ cents per cubic yard. The bid of the Bridge Co. for this work was about \$30,000 lower than that of any of their competitors. It was the only firm of contractors who figured on doing this work by machinery; the other contractors estimated on doing it by the old method of scrapers and horses.

The machine, a photo-facsimile of which is herewith presented, was conceived, invented and designed by the Bridge Company for the carrying out of its contract, and it has proved remarkably well adapted to the work and in every way a success. It would have been absolutely impossible to have excavated this ditch in the old way with scrapers, owing to the presence of water, which in the summer months stood about two feet deep in the ditch, and in the winter months was often as deep as five to seven feet. The designers of the machine anticipated this condition, and ingeniously arranged the machine to rest on the original ground at the foot of the spoil bank at the top of the ditch, and not on the bottom of the ditch, as steam excavators usually do.

A standard-gauge railroad track is laid on either side of the ditch, as may be seen in the cut. On each of these tracks are located three very heavy railroad trucks, similar to flat cars, only shorter. On these trucks are rested the three tines that span the ditch and carry the car which runs on double-track standard gauge, and on which is located all the excavating and transporting machinery, as shown in the illustration.

The cars on the tracks on either bank are moved forward eight or ten feet at each shift by means of wire ropes worked by steam drums, fastened to "dead-men" or anchors fixed in the ground 100 or 200 feet ahead of the machine; then the excavating chain and hockets are lowered by means of another steam gipsy until the hockets come in contact with the ground, and the car is started across the transverse track by means of another steel cable worked by a steam drum, and the hockets, as the machine passes transversely across the ditch, takes a cut off the top of the ditch of the whole area of the eight or ten feet which the machine moved forward; and when the machine arrives at the outer side of the ditch, the boom is again lowered and the car started back and another cut is excavated by the hockets. This operation is repeated until this section of the ditch is taken out clear to the bottom; then the ladder is raised by a steam drum so that the hockets clear the ground, and the side cars are again run ahead, another "fleet" of eight or ten feet is made as before, and the hockets are again lowered until they come in contact with the ground and the car started on the transverse track again. The hocket dump or discharge into a hopper, the bottom of which is inclined and reversible, and the material after falling into the hopper falls down over this incline bottom, which delivers it on to the rubber-helt conveyor which carries it to the spoil bank.

When the machine passes the center of the ditch, the bottom of the hopper is tilted to the other side and the material is thrown onto the other conveyor, which delivers it on the opposite bank. All these movements of the machinery are controlled by one lever man, who may be seen in the cut, standing on the platform, on the right-hand side. He has control of five separate levers: one for raising and lowering the bucket chain, one for moving the car to the right, another for moving it to the left, and another for moving it forward on the side tracks, and the fifth controls the engine. The rapidity and facility with which all these movements are made is surprising, especially when you take into consideration the momentum and immense weight of the car holding the excavator's machinery, which is about 300 tons. As the machine excavates the ditch, the track is



BLAST FURNACE AT FRIEDENSHUTTE, UPPER SILESIA. See page 99.

Good Building Rock.

The fact that the writer has been asked to pass judgement upon the value of many specimens of stone for building purposes, and that to the majority of the questions, a negative answer has had to be given, leads the writer to the opinion, that a very great number of people have wrong views upon the value of such rocks.

It is a fact by no means universally known, that rock which may appear fair to the eye is not all fit for building purposes. Many points have to be taken into consideration, and for safety as well as for economic reasons it is best to have a thorough test of the rock. The points mentioned below, are not by any means the only ones that would be considered by a chemist or economic geologist, but if carefully observed much useless expense, as well as much time and labor, may often be saved.

There are essentially two classes of qualities which may fit stones for various building purposes. First, strength and durability, which may be called necessary qualities, and second, facility of working and heavy, which may be called desirable qualities.

In the first place it is, of course, evident that the rock must have sufficient strength to withstand any strain to which it may be subjected, and must also possess qualities that will enable it to resist the usual agencies of decay, otherwise it must be rejected as wholly unfit for use in any important structure.

There are several points upon which the strength of a rock depends. A compact texture is very essential, and the value of a stone for building purposes, other things being equal, is largely in proportion to the compactness. It is essential that the grains of the stone touch each other in many points, that they may mutually sustain each other.

The second point of consideration is the degree and manner of consolidation. The cementing material must surround the particles well and fill all spaces. The intrinsic hardness, particularly if the rock is of felsitic crystals, bears largely on its value. The smaller the size of the grain, and the finer the texture, the more varied will be the direction of possible cleavage, and hence the less it will be liable to yield to a crushing force.

The durability is affected by the various conditions under which the stone may be placed, but attention will be directed only to those of the greatest importance and such facts as can be easily observed.

1. Sufficient consolidation, which has already been mentioned as a condition of strength, and this is also the more important in rock which lacks the second requisite.

2. Density, which is shown by the relative imperviousness of stone to water. If the rock seems quite porous it must, in any case, show undoubted proof of durability before being placed in any large structure.

3. Fineness and uniformity in the size of grains has a very decided influence on the durability of rock.

4. The presence of impervious minerals, of which iron pyrites is the most common, and also the most to be feared. It is even the more dangerous when disseminated throughout the rock in very fine crystals, and nearly imperceptible. Iron also occurs very commonly in the form of a carbonate, and after as a protoxide, which have a tendency to pass to a higher state of oxidation, especially in bluish or gray sandstones. In some sandstones, reddish or brown, even the cementing material may be iron oxide.

5. The presence of clay is to be looked upon with great suspicion, for it acts as a great retainer of moisture and hence is liable to cause great damage.

Good building rock on this coast is of great value and particularly in the north Pacific States, but many are disappointed in receiving an unfavorable report from a chemist. If the above-mentioned facts are borne in mind, a clew will be had to the advisability of having further tests made. In themselves they are not sufficient, but in nearly every case, if a stone answers the above requirements, it would be advisable to have it further examined.

G. W. S.

THE largest shipment of Mexican dollars went out on the last steamer for China that has been made for over one year. It aggregated nearly half a million dollars.

taken up behind and relaid in front, leaving the berm of the original ground between the toe of the spoil bank and the top of the ditch. In 15 foot cutting, the distance from the bottom of the ditch to the top of the spoil bank is about 33 feet. The cost of the machine was about \$60,000, and its output is from 80,000 to 90,000 cubic yards per month. It is now on the last section of the work, and will complete the contract in about five months.

The production of this machine was certainly a bold and original conception. It stands

unique and without parallel or approach in the history of steam excavating machinery—in this or any country.

The builders deserve great credit for their faith in the idea, and the pluck and courage which they displayed in spending so large an amount of money in the production of this machine, which was experimental. Their enterprise was amply rewarded by the grand success of the invention. The machine was built under Letters Patent dated, May 4, 1886, September 9, 1890 and December 23, 1890.

About 150 miners are at work on the Forty-mile placers, Alaska. The product this year is expected to be about \$50,000. Some miners make from \$1000 to \$1400 each, while others make but \$200 or so. Provisions are high. Flour is worth \$15 a hundred pounds, raisins 37½ cents a pound, matches 25 cents a bunch, hoon 40 cents, beans 25 cents, butter \$1.50 a roll and coffee \$1 50 for a three-pound can.

THE mining dividends paid in Montana since January 1st of this year aggregate \$2,729,200.

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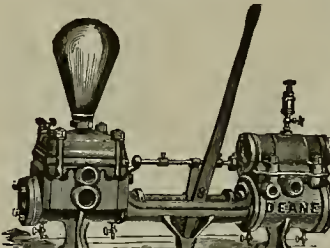
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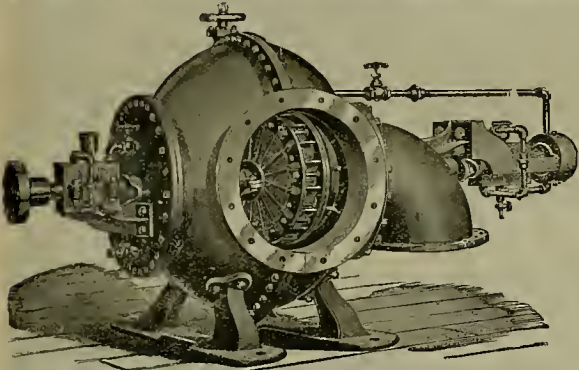
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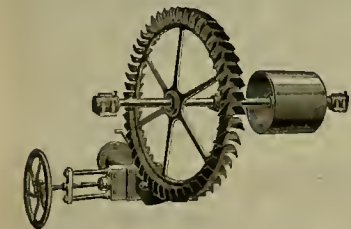


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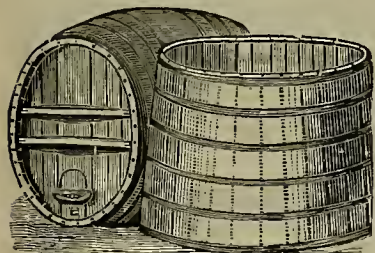
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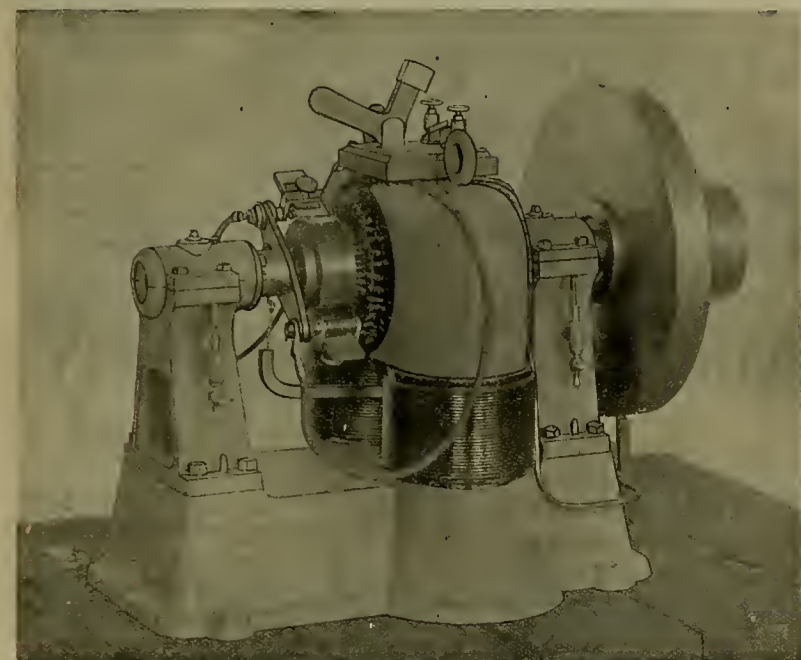
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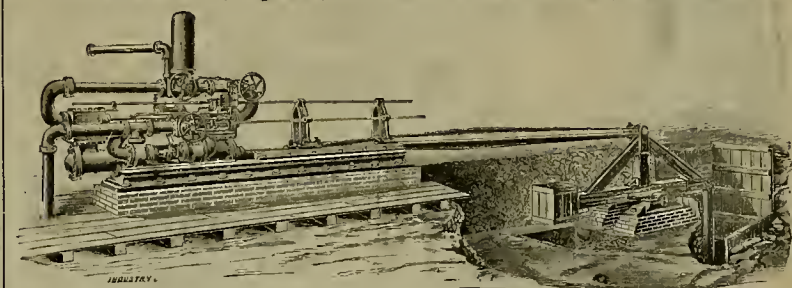
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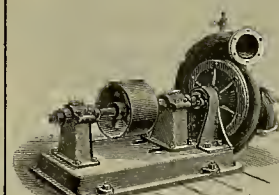
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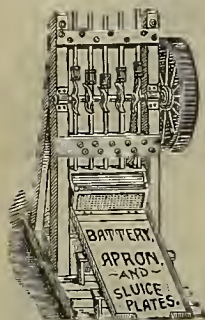
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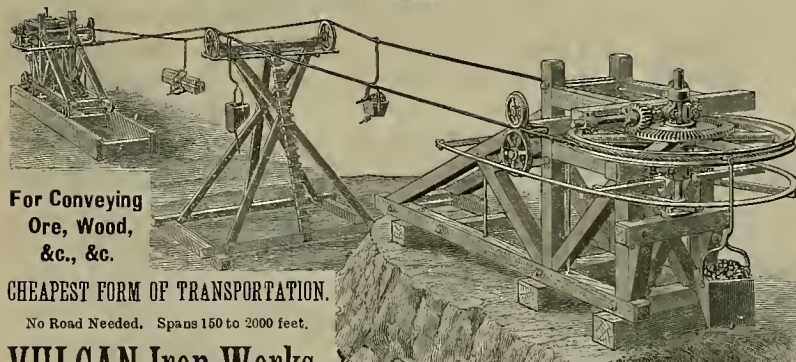


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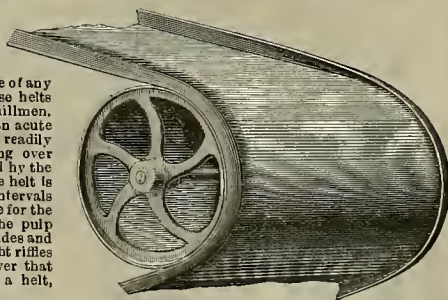
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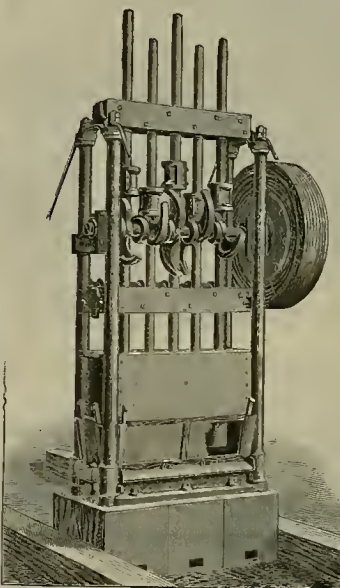
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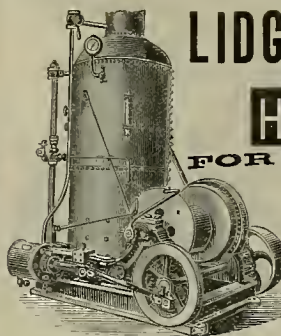
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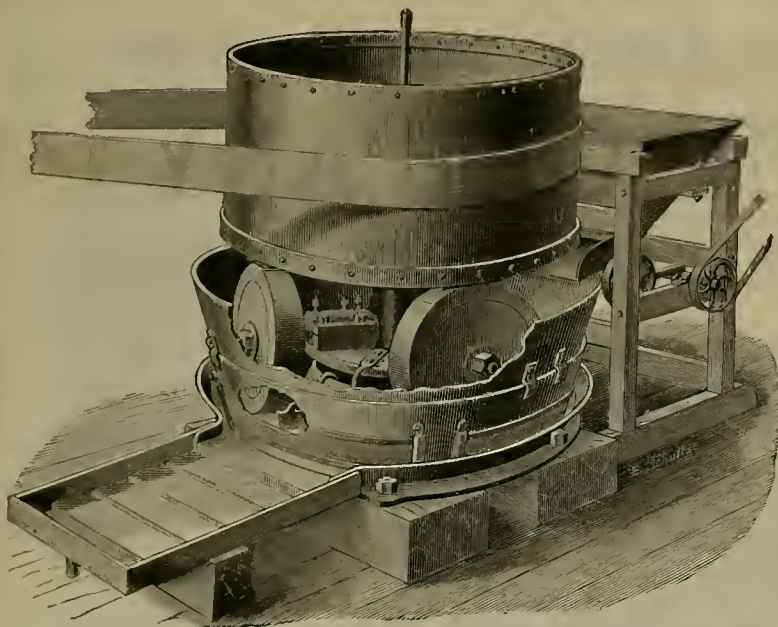
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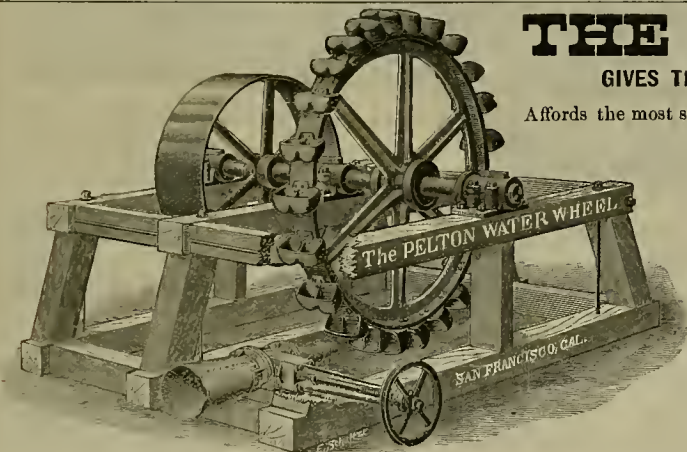
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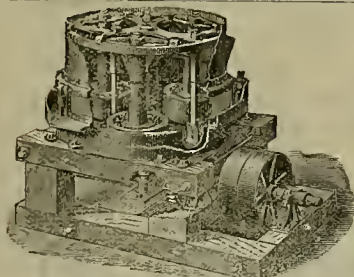
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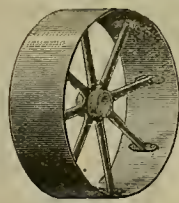
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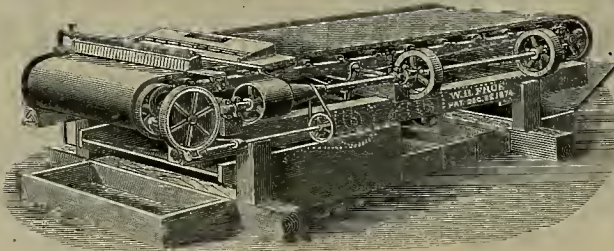
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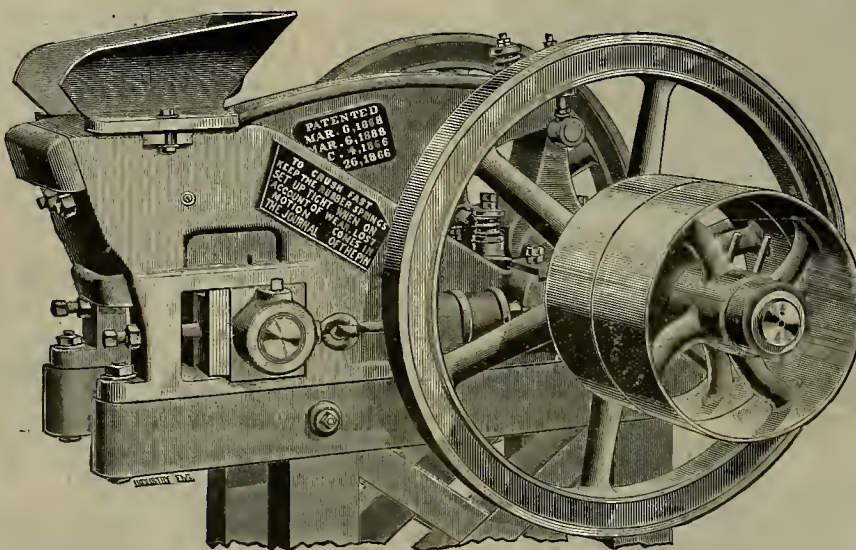
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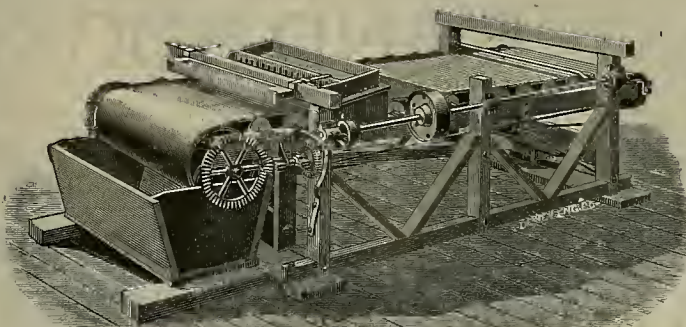
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MYRON E. RODGERS, Supt.



ANGELS, CALAVERAS Co., Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours,
T. M. LANE, Supt. Madison Mine.

ANGELS CAMP, July 25, 1891.
MR. JAMES TULLOCK—Dear Sir: We are working sulphurets from mines in Calaveras and Tuolumne Co's. We find the sulphurets saved on your machines cleaner than those saved on any other. Yours truly,
THOS. N. SMITH, Supt. Utica Chlorination Works.

Price, \$450.

For further particulars, address JAMES TULLOCK,
Angels, Cal., or

Risdon Iron and Locomotive Works,
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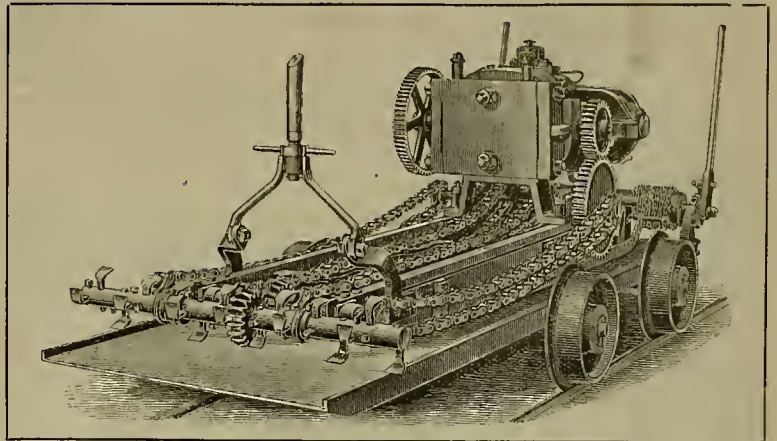


ARRASTRA RUNNING BY WATER POWER—See page 120.

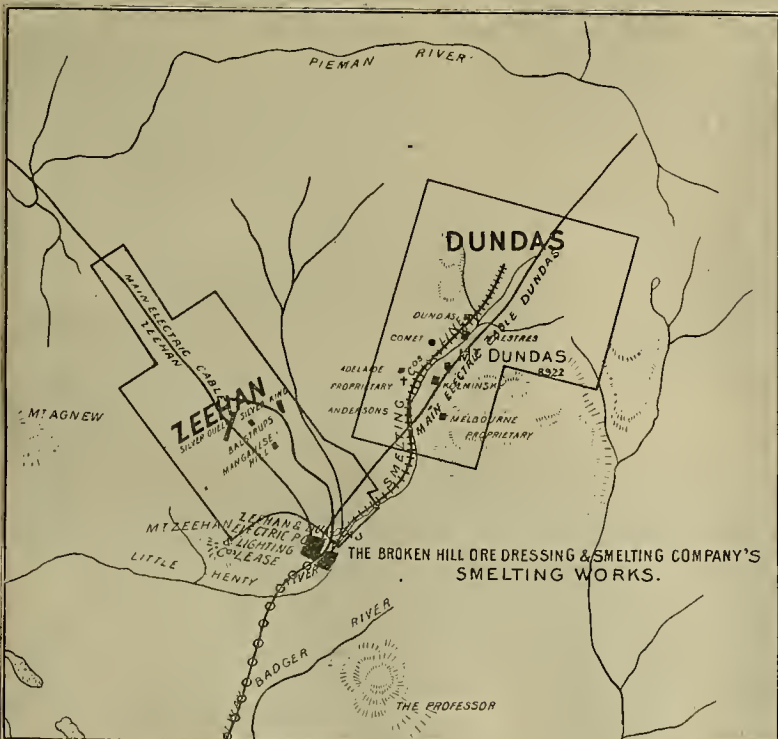
An Electric Coal-Cutter.

We give herewith an illustration of the electric coal-cutter made by the Edison General Electric Co. of New York and 112 Bush St., S. F. In this machine the under-cut is made by revolving tools, the axes around which they revolve being either a horizontal line parallel with the coal (outter bar) or a horizontal line at right angles with the coal (augers) or a vertical line (chain machine). The machines generally consist of a stationary bed upon which slides a movable frame bearing the cutting devices.

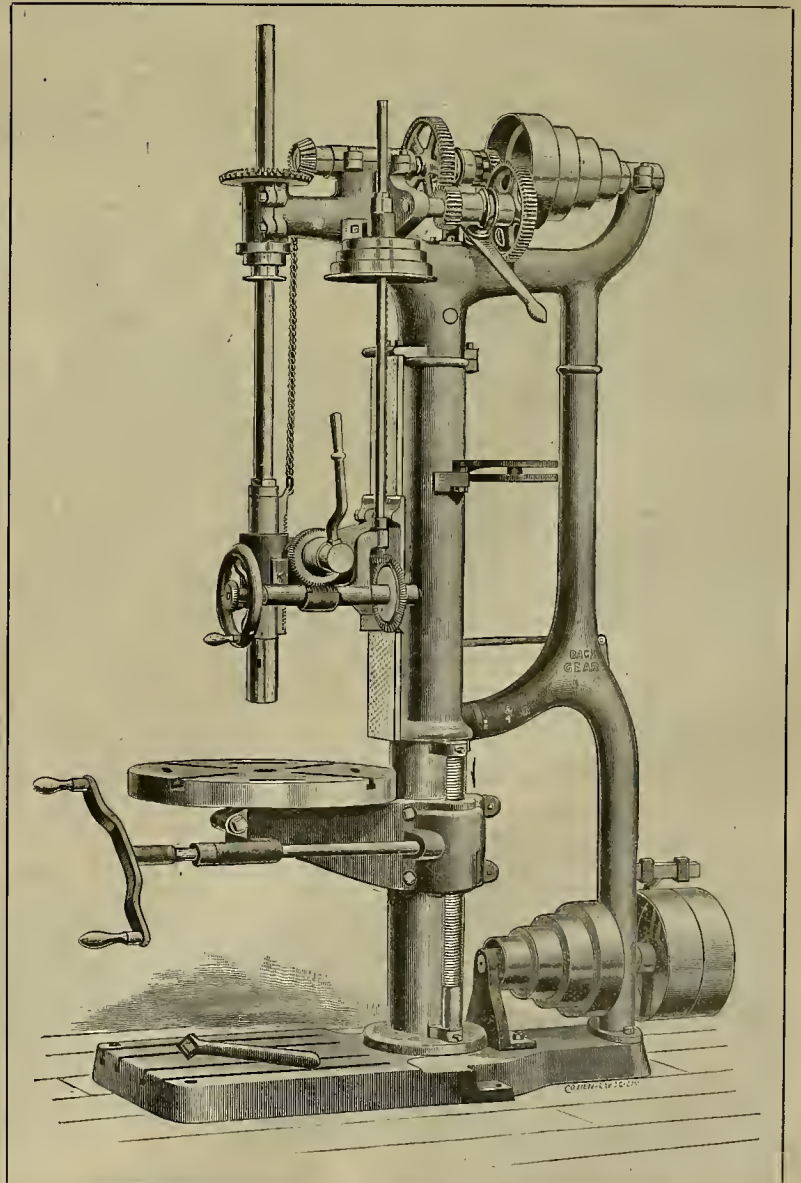
The latter is gradually fed into the oval as the knives or tools cut the oval away in front of it. The electric motor is attached to the movable frame or to the stationary bed, suitable gearing or chains transmitting the power to the cutters. The feed is automatic. The coal is generally undercut, the cutters making a groove in the coal the entire length of the bar. The motor used on this coal-cutter is capable of giving 15-horse power when doing steady work. This motor is specially adapted to the work it has to perform. It runs entirely without sparking, and has all its vital parts well protected.



EDISON ELECTRIC COAL-CUTTER.



PLAN FOR FURNISHING ELECTRIC POWER TO MINING DISTRICTS—See page 120.



UPRIGHT STANDARD DRILL PRESS—See page 120

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Amador County Mines.

(From our Travelling Correspondent.)

Irishtown.

The principal mines of this section are those of the Clinton Cons. which are 6½ miles northeast of Jackson. The Clinton mines are under the superintendency of Mr. J. B. Francis. The properties consist of the Clinton quartz mine, the Pangh, Pangh Extension and Union mine, covering 3000 feet on the strike of the vein, and with other land purchased, about 700 acres of ground. The three ledges on the Clinton Cons. are ore-bearing by a main tunnel 1000 feet long, which taps the veins 260 feet deep. In addition to the tunnel a three-compartment shaft has been started on the Union ledge. From this shaft crosscuts will be run to cut all of the veins. Between the two ledges of the Union is a porphyry dyke 60 feet in width, forming the footwall of ore and the hanging wall of the other vein. As depth is attained these two ledges out and will no doubt, in time, entirely displace it. The country rock is slate. The veins on the Union are the southeast vein, 3 to 6 feet in width and the northwest vein, 3 to 36 feet in width. All of this is milling quartz, carrying from \$4 to \$7 a ton in free gold, and 2 per cent of sulphurets of from \$40 to \$80 a ton value.

On this property the company have a 20 stamp mill of 1000 pound stamps, the mill crushing, 75 to 80 tons daily. The power is water under 365-foot head. They use a six-foot Pelton wheel; and have also a two-foot Pelton motor. In addition to the mill the property has a large boarding house, sleeping house and a number of residences in the course of construction. The Clinton also own the Maeto mine which adjoins and are about consolidating it. This is opened by a 200-foot tunnel, cutting the vein 120 feet deep. The vein runs from 4 to 40 feet in width of ore that averages \$2.50 a ton in free gold. In addition to this, there is a large amount of high grade ore, which is soaked and shipped for treatment. The mine has a 10-stamp mill. The Clinton Co., are carrying out the most extensive system of operations of any mine in the county, and in addition, will put in 10 more stamps, a chlorination plant and in all probability, an electric plant in the immediate future.

The Reed & Askey.

The Chapmans have taken hold of this old mine and have driven a tunnel and shown up a four-foot vein of good ore that they are now dropping 10 stamps on.

Leaving Irishtown, the drive down to Jackson is one to be remembered. If the reader has never been "given a fair shake," he should take a drive over that road and he will more than get it, if his rig don't break down.

Jackson.

The Casto mine, generally known as the Hardenburg, on the west bank of the Mokelumne river, three miles south of Jackson, on the mother lode. The vein is opened by shaft to a depth of 500 feet, with drift run 389 feet on the vein, which averages three feet in width. The mine has a ten-stamp mill running steadily to test the ore of the mine. At this time the mine is being developed under bond.

The mines of the Amador Gold Mining Co., although splendidly equipped, are idle, with no indication of their being operated.

The Zeile.

The Zeile, W. F. Dieter, superintendent, is now down 1160 feet and is crushing three tons a day to each of the 40 stamps. The ore is from a 25 to 40-foot vein. They chlorinate their own sulphurets. The Zeile pays because the superintendent wills it, so if the ore was but half its present value, I don't doubt but Mr. Dieter would find a way of making it pay its way. The superintendent of one of the largest mines in the county said to the writer: "Mr. Dieter is my book of reference; he has everything down to a hair, and no one figures as close."

It has not been Mr. Dieter's good fortune to have a high-grade proposition to turn out big dividends from, but he has made a record as a successful manager where all others failed. This marks him as a superintendent of exceptional business ability, in addition to his mining knowledge.

The Kennedy.

The Kennedy, J. Parks, superintendent, is now down 1350 feet, with the vein running from one to five feet of high-grade, free-milling ore that keeps the 40 stamps at work. The mine is keeping up its record as a billion producer and is to-day paying the largest amount in dividends of any mine in the State. This information is not from the superintendent, who is noncommittal, but from the friends of the fortunate stockholders.

Mr. D. G. Gates is running his blanket system of concentration below the Kennedy mill. Although the mill is equipped with concentrators, Mr. Gates catches what fine, high-grade sulphurets are carried off by the sand and water. The quantity and quality speak well for his method, which is the best arrangement of blankets in use. In addition, Mr. Gates has in operation a concentrator of his own construction for re-concentrating his sulphurets. This differs from other concentrators in this: that the feed comes on all along

one edge of the belt through a trough, which sizes the sands as well.

The vibrating motion of the table causes the sands to travel forward, while the incline gradually sends the flow across down the side as well as the end of the table. By this system the ore has to travel a much greater distance before being discharged. The coarse ore is given a chance to separate and the concentrates are very clean. The machine works finely in reclaiming sulphurets and will no doubt do well immediately below a battery.

Mr. H. M. Stetson has placed one of his Excelsior amalgamators immediately below the Kennedy mine. All the tailings from the mill flow through the amalgamator, which is a padlocked box with a system of plates and traps. When desired the box can be unlocked and the plates and traps cleaned up. The machine is purely automatic in its operation. Mr. Stetson claims that in 24 hours he caught below 28 stamps of the Omaha mill at Grass Valley \$5 in gold and five ounces of quicksilver.

The South Eureka.

J. Parks is superintendent of this mine. This location is in a very good section. The shaft was put down 40 feet to the vein, the course of which was determined by survey. The vein was struck, but so far the fissure is filled with gangue matter. The owners deserve success for their faith in thus sinking where the vein not only did not drop throughout the length of the location, but was covered all the way by many feet of cemented gravel. The hoist of the Hix mine has been purchased, and is being put in place.

Sutter Creek.

The Hector G. M. Co. owns what was formerly the old Mahoney mine. The Valentine Bros., managers, have started up the 40-stamp mill on ore from the Hubbard, McAdams and Mahoney veins. The old shaft has been reopened, timbered, and a novel and complete water-power hoist erected. Water is brought out to the mine through 5500 feet of steel pipe which delivers the water under a pressure of 450 feet. The hoist takes its power direct from two eight-foot Knight wheels, which are fastened direct to the plinths of the reel or drum, thus doing away with all intermediate shafts, pulleys and belting. The old Mahoney shaft is down 1000 feet with all the ground between the 200 and 600 foot levels to draw on. The Valentines are proceeding in a way that if success is possible will surely bring it. Once the mine's equipment is complete, it is doubtful if any other mine in the county can be worked for less money than the Old Mahoney under S. L. Valentine's management.

The Lincoln.

The creditors are operating the mine and running the mill on surface ore. As they merely aim to get out of the mine what they have got in it, no development work is carried on. It is commonly believed that the Lincoln is a good mine if properly developed and worked.

The Belmont.

The Belmont, J. H. Tibbitts Supt., adjoins the Mahoney, and is east of the Lincoln. The mine is opened by open cut and drift, on the vein, which is 30 feet in width of \$5 ore. Ten stamps are running, with 10 to 20 to be added in the near future. The company will also put down a two-compartment vertical shaft.

Wildman.

The shaft is now down 800 feet on the vein, which runs from 15 to 60 feet in width on \$3 to \$6 ore. The 30-ton mill is handling 60 tons a day of hard quartz, which Mr. J. Tregloan, the superintendent, manages to mine and mill for \$3 a ton. This mine is equipped with every appliance for saving labor.

Knight & Co.

The Sutter Creek Foundry of Knight & Co. is very generally known through the manufacture of the Knight water-wheel, which finds a steady and increasing sale from the little six-inch wheel driving a 12-inch circular saw; the 12-inch furnishes 15 horse power, or sufficient for a ten-stamp mill at the nominal cost of \$60, up to the eight-foot wheels erected on the Hector mine.

Wheels are constantly being shipped, the last order being for four wheels to the carbon coal mines of Washington. The works have just completed a very fine hoist for the south Spring Hill mine, in addition to that of the Hector mine, and have put in a number of their hydraulic pumping engines, besides furnishing a large number of batteries, blowers and other mill machinery, for all of which the works have an enviable reputation.

Amador City.

The South Spring Hill, J. R. Tregloan Supt., is opened to a depth of 900 feet with drifts run 2000 feet on the vein, which carries an average width of eight feet. When crushed in the company's 40-stamp mill, this ore keeps the mine in the rank as a dividend payer. The company has recently erected a Knight water-power rope-transmission hoist, capable of sinking to a depth of 1500 feet. This hoist effects a saving of \$7 a day over the former steam hoist, and is far more satisfactory. The mine is now equipped in every way, and that in the best manner possible, which, coupled with the large vein of high-grade ore and competent management, makes the future of the mine most promising.

The Keystone.

E. T. Hale is superintendent of the Keystone. The ore at this time is coming from old reserves on the 600-foot level, where a large

body of low-grade ore was left standing in the early working of the mine. The superintendent has 20 stamps running on this body of ore and 5 more on ore taken from different parts of the mine to prospect the ore. The Keystone has been worked to a depth of 1400 feet, and, as in all mines, a large amount of ore was left standing which will now be thoroughly tested and, if of sufficient value, worked. In a former article I gave the output of the Keystone, which was over \$7,000,000, with dividends of over \$3,000,000. All of the ground below the 1400 is virgin, and, if explored, may, in depth as at Grass Valley, come in richer than in the upper levels. Mr. Hale is conducting the mine with the greatest economy possible and working in every way to the best possible advantage. If he don't make it pay, it simply can't be done on the present ore bodies.

Bunker Hill.

John Myers is superintendent of this mine. The difficulties that recently closed down the mine have been adjusted and Mr. Myers is now busy repairing the mill, taking the water out of the shafts and getting into shape generally to "resume business at the old stand." The new shaft is being sunk and is now down about 310 feet. This, the north shaft, is operated by a Knight hoist. The motive power is conveyed 800 feet up the mountain side by five wire cables running over sheaves, delivering the power 250 feet (vertically) above the eight foot water-wheel. The entire cost of the power is but \$1.20 a day. Mr. Myers states that the action of the hoist is as quick and positive as though connected direct to an engine. This method of placing the water-wheel at the base of the mountain and erecting the hoist or mill wherever it can be best started for the most rapid and economical working, serves a double purpose in this: that the greatest power possible on the site is obtained and there is the least expense possible in moving the ore.

Gover M. & M. Co.

J. and A. B. Cole are in charge of this mine. The writer was taken all through the mine, and seldom has it been his lot to see as large reserves of ore as here contained. To all appearance, there is now sufficient ore in sight (were the entire body milled) to keep a 40-stamp mill running for ten years. The company, however, is not content with the present reserves, but is driving ahead with its drifts and will send the shaft on down to a depth of 1200 feet. The greater part of the present ore was blocked out in the earlier history of the mine—some 15 years ago. After that, the mine lay idle for a number of years, and the greater portion of the mine's workings filled up. These have now been cleaned out and retimbered, except in the extreme lower levels. On the first, or 300-foot level, the vein is 20 feet wide, and has a drift run 278 feet. On the second, or 400-foot level, the drift south has been run 300 feet and shows 15 feet of ore. The 500-foot level has a drift 300 feet south, with 20 feet of vein matter; and north 262 feet, with the vein running from 20 to 50 feet. On the 600 foot, the drift is now in 600 feet south, with 30 feet of vein and north 75 feet on a 40-foot vein. The 700-foot level is in south 300 feet with vein running from 20 to 30 feet, and north 400 feet on a 15 to 20 foot vein. In the lower levels a crosscut has been driven 50 feet and a parallel vein crosscut, which is a mine—and a big one—in itself. The mine is operated through a fine three-compartment shaft. The power at the shaft is steam. From the mine, a tramway 1000 feet long runs to the mill, over which the ore travel by gravity and discharge automatically at the mill. The mill is of 20 stamps, with Woodbury concentrators. The most interesting feature connected with the mine's machinery is the electric pumping plant of the Edison Co. with Dow pumps. This system was fully described in the MINING AND SCIENTIFIC PRESS, of July 4th. The plant is a success in every way throwing a steady flow of 12 inches of water from the 400 and 700-foot levels, where the water is held in reservoirs until sufficient is stored to employ the plant which readily pumps the mine's water all out, in five out of the 24 hours, and will no doubt be able to cope with all the water that may be reached in depth. All of the work connected with sinking, clearing out the old workings—retimbering driving the drifts ahead, rebuilding and equipping the mill, the electric plant and the thousand and one other expenses on a mine, have been paid for out of the proceeds of the ore, and a steady reserve created for future contemplated equipment.

Plymouth.

The mines of the Louvre Cons., G. M. Co., J. W. Brown superintendent, are located four miles north of Plymouth on the south bank of the Cosumnes river and on the Mother lode. The mines are opened from the mountain side, by a tunnel 320 feet long with 100 feet to go to the ore shoot 425 feet deep. The vein as far as opened, averages seven feet in width of \$5 ore. The tunnel, tapping the vein at a depth of 425 feet, will doubtless show a large vein and of a higher grade than that in the surface workings. The company has three mines—the Frankfort, Bismark and Louvre, all of which will be worked from this tunnel and a main working shaft.

The Plymouth.

W. T. Jones the superintendent is driving a drift south in new ground on the 1000-foot level, and is just getting into a body of fine

ore, that shows in the 1245 level where it is from one to six feet in width. The mill is not running at this time.

Bay State.

W. T. Jones is superintendent of this mine. The three-compartment shaft is fairly started and is now down about 50 feet. The shaft is going down in the country rock about 40 feet distant from, but with the same pitch as the vein. By keeping this distance from the vein, Mr. Jones expects to have a much smaller amount of water to haul than he would were the shaft put down on the vein. The shaft will be put down 300 feet and then a crosscut run to the vein and a level run. It is expected that the vein will be crosscut some time in January, 1892.

There has been no needless expense encountered, but the greatest economy practiced, and the people of Plumas who are backing the enterprise can see and know that their money is all being made to go to the greatest length. May the Bay State prove the equal of the old and famous mines of the section.

When the size of the veins, the average value of the ore and the number of stamps dropping are taken into consideration, it is not at all difficult to see that Amador mines stand to-day in the front rank, with every evidence that a year hence she will show a larger field and a still greater degree of prosperity.

E. H. SCHAEFFLE.

Country Roads and City Streets.

NUMBER I.

[An essay by MRS. MARY L. HOFFMAN, read at the meeting of the Women's Press Association in S. F., July 13, 1891, and furnished for publication in the PRESS.]

Prof. Shaler, of Harvard College, in an able allusion upon the subject, has referred to the fact that in Egypt, 4000 years ago, sleds were used for purposes of transportation, that these sleds when heavily loaded were rolled along the earth by means of round sticks upon which the sleds were placed, so that by changing the sticks a movement was accomplished similar to that of our horse-moving upon rollers. Later, wheels were firmly placed upon these sticks, so that each stick as an axis turned over with its wheels; then the axle came to be made fast, leaving the wheels free. And so the wheeled vehicle was evolved. With wheeled vehicles, roads became a necessity.

About 2000 years before Christ Semirais—an able woman—the Queen of Assyria is said to have built a road from Susa to Sardis, a distance of 2000 miles. A thousand years later, the inventive and practical Carthaginians were at road-building, and into battle were taking chariots. The Romans, keenly alive to every advantage, were soon excelling all their predecessors and all their contemporaries, and with substantial roads, as with bands of steel, were they hindering together the nations they had conquered.

The Greeks built roads, notably a sacred road to the Delphic Oracle.

But pre-eminently were the Romans builders of roads. If confronted by failure, from her they wrested the torch of success, and pressed forward.

The reigns of Augustus, of Vespasian and of Trajan, with the incoming of the Christian Era, were especially marked in the Roman Empire by the building of fine carriage ways.

One of the earliest Roman roads—built at least 300 years before Christ—from Rome to Capua, is to-day, after a lapse of 2200 years in excellent condition.

[In brackets I would like to say right here, that if some of the macadamized roads, so-called, to be found, not a hundred miles from this platform, be in existence two years from now, 'more's the pity.'] The Apian Way has done credit to its builders for 2200 years. When the glory of Rome departed, and her thrifty energy failed, wheeled vehicles fell into disuse, and pack animals were resorted to.

Coming down to modern times, we find roads built, first in Holland, then in Spain, and afterward in England.

The *Iconographie*, a valuable German authority, gives the date of the first road in Germany as 1753, and the average width of German roads as 50 feet, while the average width of the English road is 25 feet.

The bad roads of England in the 17th century were called "wicked ways," and when we contemplate the character of some of the officials in whose charge they were, we suspect the term to have had a double application.

About 400 years ago the wheeled vehicle appeared in modern Europe, but we were well along in the 17th century before England was at road-building.

The United States of America, representing more than one-fifth of the civilized people of the earth, is the wealthiest nation in the world to-day, and the freest. Here, surely, for bad roads there is no excuse, and as more than one-half the people of America now inhabit cities, we will give attention to city streets.

Good Roads and Prosperity.

California, our lovely State of the orange and the poppy, the fig tree and the vine, with climate and scenery unsurpassed, is in size the second State of our Union, and is in per capita wealth the greatest. Her queen city, already third in the value of her imports and sixth in value of her exports, and rapidly becoming a great commercial ruler, should not allow her streets to be excelled by those of a younger city located on a lake, while she, San Francisco,

stands upon the largest ocean of the world, with the best harbor in the world.

"The Lake City" has a system of boulevards connecting the different Parks and making a drive of many miles in extent, from park to park, these driveways being bordered by flowers and shrubs and trees and charming strips of lawn for the eye to rest upon.

Michigan Boulevard was an avenue before it was a boulevard. Upon every place of property upon that avenue was levied a tax of \$20 a front foot as a boulevard tax—this in addition to all other taxes. The \$500 tax paid by every owner of a 25-foot lot was used as a sinking fund with which to build the boulevard and forever keep it in repair; then, throughout the entire length of this avenue, trees at the curb were uprooted, sidewalks destroyed, and the same quality and style of walk and curb and pavement built and shade trees planted; then men were placed in charge, and during the summer-time not a dead leaf falls but it is immediately picked up and carried away. In winter, snow and sleet and mud disappear as if by magic, and here, as on Drexel and other boulevards, it is a pleasure to live.

Property values along the boulevard and in its vicinity have increased immensely, and the \$500 tax is already regarded with a smile of approval. In a similar manner have been built other boulevards of the same city, and we see Chicago with no heights, no ocean and no harbor, but with men and women back of her great enterprises who possess the foresight, the vim, the lavish hand that of great enterprises makes great successes. Result—a population of a million souls.

Let us copy her boulevard and the wide-awake enterprise of her men and women.

For the building and equipping of a railroad across the "Great American Desert" over mountains and through uninhabited districts, the brain and nerve have been found in California.

The inventor of the cable road, the builders of its most successful systems and great electric railroad builders have been found here.

Our Golden Gate Park has many attractive features that are unequalled by any other park of the world, and this is largely due to the excellent management of Gen. Hammond and others in power.

Our philanthropic and charitable and religious societies, with their men brave and their women virtuous and courageous, are doing good work. For all these, competent leaders have appeared; for another and possibly a greater leader, we look.

We realize with pride that the railway mileage of this country is as great as that of all the world besides; and now, should we not make permanent and attractive the ways that border our homes and that lead forth to the fragrant fields of the country?

We have men among us, wise, keen and progressive enough to build and operate railroads, to erect magnificent structures and to look after their sanitary conditions. Where, now, is the engineer, the financier, the diplomatist, able to give to even one city of this commonwealth the streets that are her due?

Government Road Supervision.

England, France and Germany have all their roads under national supervision, and each of these wily nations builds a thoroughly good road, while she watches her rivals.

If our National Government should appoint a highly qualified roadmaster, to whom the roadmaster of every State—himself a competent engineer—should be responsible, and to whom the county roadmaster should be subject, the work of each year would not only be valuable in itself, but would form a part of one symmetric whole.

Into the Legislature of Massachusetts, of New York, and of other States, bills have been introduced looking to State supervision of roads. By giving to the consideration of road and street improvement a goodly share of space, the Governors of Massachusetts and of Pennsylvania have popularized their messages.

In New England, roads for 250 years have been built at the public expense; while in Kentucky, in Virginia and in some other States, the toll-road system has prevailed. "Oppressed" Ireland abolished her toll-gates in 1853; but Pennsylvania still permits them. In some parts of the United States pack animals are still used for the transportation of merchandise—notably in the Appalachian and Cumberland mountains.

In a paper upon "Permanent Improvement in Highways" read, recently, by Mr. George E. Crane, before the Minneapolis Society of Civil Engineers, the author states that \$800,000 is practically thrown away every year by the present system of road-making in the State of Minnesota.

Prof. Shaler says: In no phase of public duties does the American citizen appear to such disadvantage as in the construction of roads. Mr. Shaler, after giving the subject the most careful attention, reckons that, even in New England, the waste of money expended upon roads, reckoning loss of time and transporting power of vehicles, wear and tear of wagons and carriages, and of beasts that draw them, averages \$10 a year for each household, a greater expenditure than that incurred for schools or for any other single element of public interest, coming near the sum of all our State and Federal taxes put together.

We hope by the assistance of an army of enlightened men and women, who are to-day making this subject a study, to hasten, through

the press and in other ways, an awakening of the great mass of taxpayers to the lax manner in which many of our roads are claimed to be built, but are not even apparently built.

(To be Continued)

The Precipitation of Metals from Hyposulphite Solutions.

CONCLUDED.

[Read by C. A. STRICKLAND, of San Francisco, before the American Institute of Mining Engineers.]

TABLE A.—Precipitating-Coefficients for c. p. Reagents.

Calculations are based upon the following approximate chemical equivalents, frequently used:

H=1; O 16; C=12; S 32; N 23; Ca=40; Ag 108; Pb 207; Cu 63.

Precipitating-Coefficients for NaHO, Consumed in the Manufacture of Na₂S₂O₃.

100 NaHO precipitates 180.0 Ag as Ag₂S.
100 NaHO precipitates 172.5 Pb as PbS.
100 NaHO precipitates 105.0 Cu as Cu₂S.
Adding 103.3 Na₂S₂O₃+5 aq.
The following quantities of NaHO and S, consumed in the manufacture of Na₂S and Na₂S₂O₃, are needed for the precipitation of metals:

For 100.	NaHO	Sulphur for Na ₂ S, Na ₂ S ₂ O ₃	Adding Na ₂ S ₂ O ₃ +5 aq.
Ag.....	55.5	29.6	44.4
Pb.....	58.0	30.9	40.4
Cu.....	55.2	50.7	76.1

Precipitation of Lead and Calcium by Na₂CO₃.

100 Na₂CO₃ precipitates 195.3 Pb as PbCO₃.
100 Na₂CO₃ precipitates 37.7 Ca as CaCO₃.
For precipitation of 100 Pb are needed 51.2 Na₂CO₃.
100 Ca are needed 265.0 Na₂CO₃.

TABLE B.—Precipitating-Coefficients for Commercial Reagents.

Caustic soda with 90 per cent. NaHO, corresponding to the English rating of 70.6 per cent.; sulphur with 95 per cent. S; Solvay soda with 98 per cent. Na₂CO₃.

Precipitating-Coefficients for Caustic Soda Consumed in the Manufacture of Na₂S₂O₃.

100 Caustic soda precipitates 162.0 Ag as Ag₂S.
100 Caustic soda precipitates 155.2 Pb as PbS.

100 Caustic soda precipitates 94.5 Cu as Cu₂S.
Adding 93 Na₂S₂O₃+5 aq.

The following quantities of caustic soda and sulphur, consumed in the manufacture of Russell's sulphide and Na₂S₂, are needed in the precipitation of metals:

For 100.	NaHO	Russell's Sulphide	Na ₂ S ₂	Adding Na ₂ S ₂ O ₃ +5 aq.
Ag.....	61.6	41.0	46.7	57.3
Pb.....	64.4	42.9	48.8	59.9
Cu.....	105.7	70.4	80.0	98.3

Precipitation of Lead and Calcium by Solvay Soda.

100 Solvay soda precipitates 191.4 Pb as PbCO₃.
100 Solvay soda precipitates 36.9 Ca as CaCO₃.
For precipitation of 100 Pb are needed 52.2 Solvay soda.
100 Ca are needed 270.3 Solvay soda.

TABLE C.—Weights of Precipitates and their Percentages in Metals.

From 100.	If precipitated by Russell's Sulphide.	Na ₂ S ₂	CaS ₂
Ag.....	124.3	129.8	174.1
Pb.....	125.3	130.9	177.3
Cu.....	141.6	150.8	227.3

Weights of Carbonates.

The precipitation by Solvay soda will produce from:

100 Pb.....129.0 P CO₃
100 Ca.....250.0 C CO₃

Percentages of Metals in Sulphides

Percentage of	Russell's Sulphide.	Na ₂ S ₂	CaS ₂
Ag in Silver Sulphide.....	80.4	77.1	57.4
Pb in Lead Sulphide.....	79.7	78.4	58.4
Cu in Copper Sulphide.....	70.6	66.3	44.0

Percentages of Metals in Carbonates.

Lead carbonate, 77.5 Pb.
Calcium carbonate, 40.0 Ca.

TABLE D.—Financial Results.

Showing the cost of precipitation by Russell's sulphide, Na₂S₂, and by Solvay soda, assuming the following prices for commercial chemicals put down at the mill: caustic soda, 5.5 cents; sulphur, 3.5 cents; Solvay soda, 4.0 cents; hyposulphite, 4.0 cents per pound.

Cost of Precipitating Metals as Sulphides.

For 100 Pounds	By Russell's Sulphide.	By Na ₂ S ₂	Gain in Na ₂ S ₂ O ₃ +5 aq.	N't cost using Russell's Sulphide	Difference in cost between R.S. and Na ₂ S ₂
Ag.....	\$4.82	\$5.02	\$2.20	\$2.63	\$2.73
Pb.....	5.04	5.25	2.40	2.64	2.85
Cu.....	8.28	8.61	3.93	4.35	4.68

Cost of Precipitating Lead and Calcium as Carbonates.

For 100 pounds Pb., \$2.09
For 100 pounds Ca., 10.81

TABLE E.—Showing the quantities of caustic lime and sulphur consumed in the manufacture of CaS₂, needed for the precipitation of metals.

For 100 pounds.	Caustic Lime.	Sulphur.	Adding Na ₂ S ₂ O ₃ +5 aq.
Ag.....	302.4	130.2	68.8
Pb.....	316.1	130.1	71.9
Cu.....	519.0	223.4	113.0

This table is based on comparative statistics obtained in the Consuehirachi mill, Mexico.

TABLE F.—Showing the cost of precipitation by CaS₂, assuming price of caustic lime at 3 cents per pound, and that of other chemicals, the same as given in table D.

Cost of Precipitating 100 Pounds.	Caustic Lime.	Sulphur.	Total.	Gain in Na ₂ S ₂ O ₃ +5 aq.	Net Cost.
Ag.....	\$2.58	\$4.56	\$6.82	\$2.75	\$4.07
Pb.....	2.37	4.78	7.13	2.83	4.25
Cu.....	3.89	7.82	11.71	4.72	9.99

This table is based upon the figures given in table E.

§ 7. Application of the Tables to Special Cases.

In this section the tables will be applied to examine the cost of precipitation in special cases. It is assumed that the ore contains lead and a small amount of calcium. Although its contents in copper are insignificant, the copper from extra-solution, necessary for treatment, comes to precipitation. We will neglect the comparatively small amount of silver precipitated with the lead-calcium carbonates, assuming that each silver is paid for at the same rates as silver in sulphides. Prices of chemicals are taken as stated in Table D.

We further assume the following terms, according to a case as it really exists, for the disposal of the sulphides to smelting-works and the cost of handling the precipitates:

The Mareac mill, according to W. A. Wilson, sells its sulphides to the Omaha & Grant S. & R. Co., the latter paying for 97 per cent. of the silver, New York quotations, charging \$30 per ton for treatment, but paying freight from Park City to Omaha. No allowance is made for copper or lead. [Gold is paid for at the rate of \$20 per ounce.]

Carbonate precipitates are taken at the same rates, as also the low-grade precipitates from the first wash-water. It will be seen at once that the disposal of carbonates at sulphide rates cannot be favorable to the separate precipitation of lead in the presence of calcium. The Mareac mill used this method formerly for a short time only, then abandoned it, but has adopted it again recently. A better market for carbonates will, no doubt, be found hereafter.

The cost of handling precipitates is assumed at \$10 per ton.

EXAMPLE.

The solution obtained in lixiviation contains per ton of ore:

- 3 pounds (43½ ounces) silver.
- 1 pound copper.
- 3 pounds lead.
- 2 pound calcium.

Four pounds sodium hyposulphite have to be regenerated from tetrathionate in precipitation. This expense, however, we need not consider, since it is the same for Methods 1 and 3.

I hardly need remind the reader that in precipitation Na₂S₂ free from Na₂CO₃ is used, and not an oxidized solution of Russell's sulphide, which would also precipitate calcium in Method 1, changing the weight and grade of the sulphides.

Weights of Precipitates.	Precipitation by Method 1	Method 3.
Sulphides.....	9.32 pounds.	6.40 pounds.
Carbonates.....		5.12 pounds.

Sulphides contain		
Ag, per ton, oz.....	9,338.5	16,201.7
Cu, per cent.....	10.73	13.62
Pb, per cent.....	32.19	

Carbonates contain Pb, per cent, 58.6.

Cost of	Cents.	Cents.
Precipitation.....	21.42	25.45
Handling.....	4.66	5.26
Reduction, sulphides.....	13.95	15.78
Total.....	40.03	46.49

It will be seen at once that separate precipitation of lead and calcium cannot be profitable if carbonates are sold at sulphide rates. Also, that Method 3 becomes more costly, the more calcium is present in proportion to the lead.

We will now assume 90 per cent. of the lead in carbonates to be paid for at the rate of 2 cents per pound, and freight and smelting-charges to be \$15 per ton; also that silver is paid for at sulphide rates. This would give the following result:

Precipitation.....	Cents.
Handling.....	25.45
Reduction, sulphides.....	5.20
Reduction, carbonates.....	8.70
Total.....	42.05
Less amount realized from sale of lead, ...	5.40
Total.....	37.25

Should the buyer, however, deduct 5 per cent. of the silver in place of 3 per cent., nearly all the profit from the sale of lead may be consumed, or even a negative balance left, depending on the richness of the carbonates in silver.

It is hardly necessary to continue this discussion. The separate precipitation of lead and calcium by Solvay soda is evidently not so profitable as its advocates claim. If lead alone is present, or the amount of calcium is very slight in proportion to lead, Method 3 can be used to advantage.

It is claimed that the removal of calcium from lixiviation-solution has a beneficial effect on the extraction of the silver. Whether this is true, I do not know.

If sulphides are refined at the mill by a humid process with sulphuric acid, the absence of lead and calcium is essential to success; and in this case Method 3 is of great value, as I shall demonstrate in another paper.

My friends who operate lixiviation-works will, most likely, object to many conclusions I have drawn in this treatise, saying that the process as carried out in practice is not like that operated here on paper. If they will bring out an array of facts, proving that I am wrong, I shall consider myself the gainer, earning the thanks of the profession for bringing information to light which otherwise would have remained hidden.

APPENDIX.

The Loss of Hyposulphite in Lixiviation.

In connection with precipitation, some remarks about the loss of hyposulphite in lixiviation will be pertinent.

As has been shown, large amounts of hyposulphite are added to the stock-solution in precipitation, even with freshly prepared caustic or sodium sulphides. From this it might be expected that the stock-solution would always increase in strength and concentration. This is only the case if, in ordinary lixiviation, CaS₂ is used as precipitant, and comparatively large amounts of copper and lead are thrown down together with the silver.

The losses in hyposulphite are partly mechanical, and partly caused by chemical decomposition. The mechanical losses take place when first wash-water is replaced by stock-solution, and again when the latter is replaced by the second wash-water. In these operations, no matter how carefully they are conducted, water and stock-solution are more or less mixed, especially where the filters are not in good condition and are partly choked. Thus, in replacing the first wash-water, a certain quantity of hyposulphite solution results, too weak to be mixed with the normal solution; for this reason it is transferred to a separate precipitating-tank, precipitated there by itself, and the decanted clear solution run to waste. As soon as the solution shows a certain strength in hyposulphite, which is ascertained by the iodine-test, it is turned into a regular precipitating-tank. The same is the case in replacing the solution by the second wash-water. The higher the percentage of hyposulphite in the stock-solution, the greater this mechanical loss.

The chemical losses are caused as follows:

1. By oxidation in contact with the atmosphere, hyposulphite being converted into sulphate. This loss depends on the quantity of solution used per ton of ore and kept in rotation, its temperature, and upon atmospheric conditions, most likely the contents of the atmosphere in ozone.
2. By converting hyposulphite into tetrathionate in preparing extra-solution, and further formation of tetrathionate by atmospheric oxidation of extra-solution. This loss is, however, made largely good again by close precipitation, and may be almost completely covered by over-precipitation.
3. By decomposition of extra-solution with formation of Cu₂S and sulphates; this loss being final and irremediable. It is greatest where extra-solution has to perform much work—i.e., where standard extra-solution must be used warm and is circulated. It is, no doubt, greater if a Koerting ejector is used for circulation than with a geyser-pump. This subject is discussed in my paper, "The Details of Construction for a Modern Lixiviation Plant."

Mining Bureau Museum.

The following are among the recent additions to the collection of the California State Mining Bureau:

- Chalcosite—Abiquiu, N. M.
- Apatite, with fluor spar, and calcite—Peterborough, Canada, from F. C. Brodie.
- Gold quartz, rich in free gold in "wire" and "leaf" form—Green Mountain mine, Siskiyou Co., Cal.; Allen Bros.
- Gold quartz (free gold)—Cincinnati Belle mine, San Diego Co., Cal.
- Kaolin of fine quality—Heraldberg, Sonoma Co., Cal.; F. H. Sheldorf.
- Cookeite—Oro Grande, San Bernardino Co., Cal.; H. C. Adams.
- Gold quartz and silver ores—Fifteen rich specimens, several showing abundant free gold and native silver, from leading mines of Sierra Co., New Mexico; C. H. Laidlaw.
- Tremolite—Halsed mine, Plumas Co., Cal.
- Calcite—Two crystallized specimens, Lancashire, England; Williamsburg Scientific Society.
- Chalcopyrite—From a large deposit in Josephine Co., Oregon; W. Worthington.

BENT WHALEBONES can be restored and used again by simply soaking in water a few hours and then drying them.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

KENNEDY.—*Ledger*, Aug. 15: The cleanup at the Kennedy this month is said to equal, if not exceed, the big yield of the previous month. This mine is producing more bullion than any quartz mine ever before yielded in this county, for the same amount of ore crushed. With a 40-stamp mill it is surrendering as much gold as the Plymouth Consolidated did in its palmiest days with twice that number of stamps. The magnificent record it is making ought to encourage the development of other claims now idle in that vicinity. A strong impression exists in the minds of many that the Oneida, the adjoining claim on the north, which was abandoned over 10 years ago, ought to be reopened.

MINE ATTACHED.—George Newman commenced suit last Wednesday against the Clinton Con. M. Co., operating the Gardner property near Clinton, for the recovery of \$517.90, alleged to be due for supplies and money loaned. Attachment papers were placed in the hands of the sheriff, who went up and served them the same afternoon. The officers of the company have not been at the works for two or three weeks. The news of the attachment was at once telegraphed to the office in San Francisco, and word was returned that some of the company would be up this (Friday) evening and settle everything. The mine and mill are running as usual, the sheriff leaving a keeper in charge. Different opinions are entertained as to what this action will lead to. The company has paid several dividends of 15 cents per share. They are making extensive surface improvements, sinking a shaft, putting up hoisting works, chlorination works and dwelling houses, and from all these indications one would suppose they had a good paying property and were intent upon the legitimate development of the same. On the other hand, it has been hinted that there has been considerable dealing in the stock. How this suit will affect the future operations remains to be seen. The employees are about 50 in number. They have been paid up closely, there being only one month's salary owing, which became due this week. It is generally believed that matters will be straightened out in a few days.

THE BUNKER HILL MINE paid the wages of employees for the month of July, as per agreement. The back indebtedness has not been reduced, and probably will not be until the complications of the company in the East are straightened out. At the old Keystone a new winze is being sunk to explore the mine to a considerably greater depth. The prospects of this veteran gold-producer are reported to be brightening.

SUTTER CREEK.—*Cor. Amador Ledger*, Aug. 15: The Lincoln has been brought to a temporary standstill, on account of a slight break in the ditch. It will soon be in operation again, however. The Hector and the Belmont paid off this week. The hoisting works at the South Eureka are about completed. It is expected that sinking will be resumed the latter part of this week. The transmitting power, which is 550 feet from the shaft, works like a charm. The cut-off apparatus, which is a contrivance of Andy Riley, is an excellent thing. It is operated by a hand-lever, and the machinery can be reversed in an instant. Everything about the premises is as complete as can be seen in the county. The work of putting up a new hoist and other improvements at the Hector is progressing rapidly, and in another three weeks everything will be completed. The water will then be taken out and drifting will be pushed ahead.

Calaveras.

INDIAN CREEK.—*Cor. Calaveras Prospect*, Aug. 15: Cunliffe and Driver are engaged upon their mine on Indian creek at present. They are engaged in running a level at a depth in the shaft of 200 feet and are running toward a chute that was formerly exceedingly rich. J. Sublett has been having a quantity of ore from his mine crushed at the Total Wreck mill previous to the removal of said mill to Indian creek. The crushing from all accounts will net the gentleman a good round sum and be a flattering yield. Some of the ore was rich in specimens.

El Dorado District.

GOLD DISCOVERIES.—*Mt. Democrat*, Aug. 15: Some important discoveries of gold are being made 15 miles east of this city in the headwaters of Long canyon. A few months ago Dan Coughlin, Supt. of the Rogers mine at Smith's Flat, Wm. Weiman and Mr. Nedecker, made a location on Rich gulch, a tributary of that stream, where they have been working for about five weeks. In an interview with Mr. Weiman, we learn that the gold is of a coarse nature, being very smooth, clearly indicating that the stream has been fed from a gravel channel existing under the lava-capped ridge which runs south of and parallel with the South Fork of the American river for a distance of 30 miles easterly from Smith's Flat. The fact of the existence of a rich channel in this ridge has been demonstrated by boring at the Blair mine about the Nine Mile House.

BLUE STAR.—At the Blue Star mine, in Nashville district, a shaft has been sunk 70 feet on a four-foot ledge of good ore. A tunnel is now being run to cut the ledge at considerable depth at the contact between slate and granite. This promises to make a good mine. The Los Padre mine, in the same district, is turning out excellent ore, and bids fair to become one of the leading mines of the district. Nic Miller is opening a mine in the same belt east of Nashville, from which ore is now being taken showing free gold. Several men are at work at the Oaks mine, near Henry's Diggings, from which we get favorable reports. The Parker mine is running regularly and is making its regular output of bullion. The Dalmatia output is improving. Capt. Newton was in from the Darling mine and reports everything as progressing satisfactorily.

CHILI BAR.—Thirty-four dollars to the pan was obtained in a claim on the American river below Chili Bar during the week. Good ore is being obtained in the upraise at the end of the tunnel, which is in 2000 feet. The south drift in the Gentle Annie mine is turning out ore of better quality than any heretofore found in this mine. Their last cleanup showed a decided gain.

Napa.

A DEPOSIT OF ALUM.—*St. Helena Star*, Aug. 15: Orin Caverly, who owns a small place in what is known as the Oakland colony, in Conn valley, about four miles from St. Helena, has discovered a deposit of alum rock on his place. Mr. Caverly came to town Wednesday and left a sample of the rock. It has the appearance of alum and has the exact taste. The gentleman says the rock lies in large quantities in the hills on his place, and thinks it may prove a valuable find. Thus one more mineral is added to the long list which makes our county famous.

Nevada.

GOLD EXTRACTING COMPANY.—*Grass Valley Telegraph*, Aug. 15: The Grass Valley Gold Extracting Co., J. W. Higgingbottom general manager, is making extensive improvements upon its works on the line of the narrow gauge railroad. A crushing plant is to be erected which will consist of Krom's steel rollers and rock-breakers. The plans for the same have arrived, and the masons are now engaged in putting in a foundation. This plant will change the base of operations of the company, who will hereafter crush and chlorinate fractious ores instead of chlorinating concentrates or sulphurets from free milling quartz. Several tons of quartz are already in the bins, to be crushed as soon as the rolls are in position. Mr. Higgingbottom has ordered quite a large quantity of the celebrated Meadow Lake ore to make a test, as he believes that the gold can be extracted by the Pollock process. Mr. Higgingbottom is engaged in driving a tunnel into the hill south of the works, from which flattering prospects come.

THE KEYSTONE LEDGE.—*Grass Valley Union*, Aug. 14: Adolph Dulmaine, who is a large shareholder in the Keystone ground, has been at work lately getting out a crushing from a prospect shaft on the ground. There were nine loads of rock taken from a 15-inch ledge and hauled to the Crown Point mine, where it is now being crushed. The ore looks well, and a generous yield is expected. The Keystone is on Ophir Hill near the Empire.

SLATE LEDGE.—*Telegraph*, August 13: Work is going briskly on at the Slate Ledge mine, on Wolf Creek, and the 10 stamps are kept running steadily. The tunnel is now in 1400 feet and stopping has been commenced. The ledge averages 18 inches in thickness and 10 men are employed in and about the mine. There are 50,000 shares in the mine, all of which are owned in this vicinity. Mr. Alfred Perrin, who is the principal owner, says that the returns are most gratifying. The tunnel is still being pushed ahead.

KEYSTONE PROSPECT.—Adolph Dulmaine and Alcead Sauvee are taking out some ore from a prospect shaft on their claim known as the Keystone. The location is on Ophir Hill in close proximity to the Empire. Nine loads of the ore has been hauled to the Crown Point mill and is being crushed. It looks well and good results are anticipated.

WORK BEGUN.—*Grass Valley Telegraph*, Aug. 14: This (Friday) morning Wm. May, the well-known millwright, with a corps of assistants, began work at the California mine, in the way of putting up buildings for the hoisting and pumping works and in placing the machinery. The material, machinery and all, is now on the ground, with the exception of a few pieces which can be furnished at a moment's notice. Mr. May thinks that it will take about 30 days to complete the job. The engines, boilers, hoisting gear and in fact everything about the premises is in first class condition, and as soon as the hoisting works have been completed, Mr. May will put in a battery for stamps. The machinery will, for the present, be run by steam.

AN OLD TUNNEL.—*Truckee Republican*, Aug. 15: A few days ago, while working in the timber near his mill, which is situated about five miles south of town, George Schaffer discovered an abandoned tunnel on a quartz ledge. It is in the side of Snobomish mountain. Some of the rock was taken out and assayed \$47.40 per ton. The tunnel is probably 30 years or more old. In early days, there was a great mining excitement in the region of country extending through the section mentioned, Elizabethtown, and Knoxville, all lying between Truckee and Tahoe. There are many old tunnels in this region that have been known for many years, but this present discovery is a new one in a district not before known to have been prospected. This work was done in the days of placer mining before it was known how to handle quartz. Mr. Schaffer informs us that the quartz taken from the dump at the mouth of the tunnel was sent to Sacramento, and assayed \$40 per ton in free gold, and \$1.75 in silver. The tunnel has been timbered and a track was laid. The timbers are now mostly decayed, so long ago was the work done. The tunnel is about half full of water. Mr. Schaffer has employed men to go to work Monday morning baling out the water. He will thoroughly prospect the place.

Mono.

STANDARD.—*Bodie Miner*, Aug. 14: An extra force of men have been at work at the Standard the past week putting in a new pump and overhauling the pump engine. The old hob has been in use altogether 28 years, having done service for 17 years on the Comstock before being brought to Bodie, and has been in use here for 11 years. The hob is 30 feet long by 26 inches wide and 27 inches thick, and is of pine, having been cut from a mammoth tree at Mono Mills. The putting in of a new hob is a difficult task, and it will probably be two weeks before the job is completed. The pump engine is being put in order so as to get water for mill purposes. Last month the Standard shipped bullion to the amount of \$23,327.24. Much work is being done and the mine is looking well.

Sierra.

MARGUERITE.—*Mt. Messenger*, Aug. 15: Daniel Ware informs us that a force of men has been put out to repair the Marguerite ditch, and that work on the mine will be commenced as soon as water can be got through the ditch.

THE EXTENSION MINE yielded 79 ounces of gold for last week's run. The company has begun the erection of a large boarding house, which was an absolute necessity before any more men could be employed. The outlook for the mine was never so promising as now, although the erection of the necessary buildings and the preparations for winter, will prevent the declaration of dividends for some time. Now that the prospect dump is available, it has been ascertained that the gravel is yielding \$2.25, the expense of working being about 80 cents a cubic

yard. The channel is about 300 feet wide, as far as prospected.

GOLDEN GIANT.—The workmen in the Golden Giant have just raised a shaft 80 feet and find pipe-clay on the bedrock. The only better indication would be to find gravel, but not as high as that. When the tunnel is put ahead the channel will be found and it will, beyond doubt, be good. There will be indications when they are near the channel, and raising a shaft every few feet is a waste of money. The Wide Awake mine is prospecting finely, the gravel paying about \$2.50 to the carload, it is said. Work of prospecting the Rocky Peak drift claim is to be begun again soon at a different point from where it was attempted before.

HOWLAND FLAT.—*Cor. Mt. Messenger*, Aug. 15: Running through this section of country are to be seen numerous quartz stringers, of varying widths, which are generally considered barren and worthless. This is not altogether the case, however, as some of them contain free gold, possibly in paying quantities if systematically looked after. Cox and Downer have a very promising claim of this character, near here. In a very quiet way several thousand dollars have been taken out. I was shown by Mr. Cox, about a ton of this specimen rock, some of which was exceedingly rich. The owners are pushing the work of development as rapidly as possible, and I was informed that three good chimneys had been discovered within a distance of 600 feet. Some quartz prospector from the lower county has C. W. Hendel surveying and locating a quartz ledge at Chanderville. The recent developments made by Cox & Co., has created quite a quartz excitement in this section, and the result will be the finding of some valuable ledges, which will be of more than passing interest to those making the discovery, and of substantial benefit to the county and State generally. The Midas drift mine has been an assessment mine up to this time. Much work has been done, and tunnels and gangways driven, but without finding gravel rich enough to pay a profit. Very recent developments seem to warrant the conclusion that the main tunnel has not yet reached the pay channel, and the stockholders are now more hopeful.

PORT WINE shows more signs of life than most of the mining towns in this section, and reminds one in no small degree of earlier times when the Slope and the Queen, etc., furnished scores of hardy miners with an opportunity to labor. The Riffle drift claim, near and above Grass Flat, cleaned up recently, with results that were satisfactory to the owners. Twenty men are employed here. The main tunnel is about 900 feet long, two-thirds of which was through hard rock, 1000 feet of it costing \$22 a foot. The gravel is blue and the wash heavy. The gold sells at La Porte for \$18.50 per ounce. The channel is believed to come down from the neighborhood of Table Rock.

Placer.

THE MOORE.—*Herald*, Aug. 15: T. M. Thorpe, one of the owners of the now famous Moore quartz mine, located about a mile and a half west of Auburn, was in town a few days ago, and he tells us that since they got through with the dead work in straightening out their shaft, they have been taking out as rich rock as ever came from the mine. Since their last crushing, they have taken out some \$6000 or \$7000 in specimens, and the ore on the dump, after being thus culled, it is estimated will go at least \$100 to the ton. This ledge has been rich at all points and at all depths as far as prospected, and the beauty of it is, the deeper they go the richer it gets.

Siakiyou

SCOTT BAR.—*Cor. Telegram*, Aug. 15: The mines as usual are in full blast. Many of them yield fair returns to the owners. The Gold Hill Co. intends to renew operations in their mine on Gold Hill next week. This mine, when developed, will no doubt rank as one of the foremost mines in the county.

San Diego.

GOLD KING.—*Julian Sentinel*, Aug. 13: Rumors of a rich strike at the Gold King was confirmed by a personal visit to the property. The rich ore comes from the 100-foot level, and specimens shown us are unsurpassed by anything in the camp. A thousand dollars is an estimate of the run of a ton of such rock. Not only is the ore very rich, but the adjoining walls of earth and sandstone are full of gold. The vein so far opened is 18 inches in width, and 40 feet of this is in sight. The extent of this new find is unknown, but is now being prospected. At the 180-foot level of the King, a new vein has been cut into that shows some promise. The future of this admirably equipped mine is certainly encouraging. Charles Cox has taken a contract to continue work upon the Waterman tunnel, which was stopped by the death of Governor Waterman. The tunnel is in 615 feet now, and further construction will be made in the expectation of tapping the richness of the famous Blue Hill. Sid Wilcox will commence work on the Ella mine this week. This mine has paid well and could now be developed into a paying property. A part of the machinery for the new stamp-mill at the Black Eagle, on Mesa Grande, will be on the ground this week.

Shasta.

THE GLADSTONE.—*Redding Free Press*, Aug. 15: Col. Clark and family, of the Gladstone mine, were in this city Tuesday. He informed a reporter of this paper that the Gladstone was netting splendid dividends for its owner. A great deal of money has been expended to open the mine systematically, and it is now in splendid condition. Since January 9000 tons of ore have been crushed, and at present 60 tons are crushed every 24 hours. Twenty stamps are employed, with two Huntington mills, which are now used to recrush the ore passing under the stamps. The sulphurets are saved, and when there are a sufficient number of tons collected, the necessary plant for working them will be purchased.

NOTES.—It is reported that machinery is on the way to work the ore deposits in the old Donkey mine near Furnaceville. Parties were negotiating for the mining property of Mr. Carr, in Trinity county, but after the price had been fixed he flew the track. The Gladstone M. Co. of French Gulch will soon put to work three Edison electric drills—the first to be used in this county. Col. Ellis has returned from S. F., and report says that he has sold his mining property on Squaw creek to the Uncle Sam Co. Wm. F. Miller has started his reduction works this side of Middle creek on the railroad, and is working ore from what has been

formerly known as the Hartman mine. Ed Minot, who has been overhauling some of the machinery at the Walker mine, Old Diggings, informs us that the Mammoth Co., which has leased the Walker mill, has some 30 men engaged and is getting out some excellent ore. The mining venture of Messrs. Bugbee, Biegle & Bouk, who purchased and bonded the Sky Blue, Cross Bow, and other claims on the Sacramento river above Middle creek, is quite encouraging. In the shaft of the Sky Blue they are taking out ore which goes about \$25 to the sack, and in the Cross Bow, at a depth of but 25 feet, they have an eight-foot ledge. The free-milling ore they are working, being careful to save the slime, while the sulphurets, which are very rich, they will ship below. W. D. Biegle is spending almost his entire time at the mill.

Tuolumne.

SINKING.—*Tuolumne Independent*, Aug. 15: A new contract has been let in the Con. Eureka mine, near Summerville, for sinking the shaft 100 feet deeper. The contract was awarded to W. F. Bawden, late of Grass Valley, at \$14 per foot. Some time ago, Supt. C. H. Thomas discovered a continuous pay shoot in the hanging-wall, and proposes to keep sinking. When this contract is completed, the mine will be the deepest in the county, reaching a depth of 1030 feet, making the Con. Eureka the deepest mine in Tuolumne.

A SMALL STRIKE IN THE BONANZA.—*Union Democrat*, Aug. 15: Last Friday, the Bonanza mine yielded up a small bunch of gold; just how much the pocket contained is hard to tell. It is reported on good authority that the find amounted to \$2000, while on equally as good authority it is stated that between \$3000 and \$4000 were taken out. However, it is agreed all around, that there is a fine prospect for obtaining more in the near future.

NEVADA

Washoe District.

ANDES.—*Enterprise*: On the 420 level north drift from east crosscut No. 3 was extended 19 feet in quartz of low value. East crosscut No. 4 from the main north drift advanced 13 feet in quartz, yielding low assays.

UTAH.—The southeast drift from the winze station has been extended 36 feet; total length, 130 feet, continuing in a favorable formation of vein porphyry, clay and quartz.

SIERRA NEVADA.—The Kenosha tunnel has been enlarged and repaired 70 feet; total, 790 feet. On the 630 level, west crosscut No. 1 from north-west drift, 571 feet from the shaft, is advanced 815 feet, 35 feet having been made during the week.

POTOSI.—On the 1100 level, at a point 230 feet south of the Chollar incline and 75 feet south of north line, a crosscut has been started east, which is now in 14 feet. It has passed through 3½ feet of ore, the average assay of which was \$60. On the 1200 level have started a crosscut east, 100 feet south of north line, which is now in 13 feet; face in porphyry. On the 1300 level, 140 feet north of south line, have started a crosscut east, which is now in 20 feet; face in porphyry. We are opening a station at the 1400 level in the winze.

CHOLLAR.—The south lateral drift from the incline station, 1500 level, is out 13 feet; face in hard porphyry. Extracted and sent to the mill the past week 542 tons of ore worth \$24.71 a ton, as per battery samples.

UNION SHAFT.—West drift from the shaft, 900 level, has been advanced 50 feet the past week, making a total distance of 900 feet; face in porphyry.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level, is out 65 feet; face in quartz yielding low assays.

EXCHEQUER.—East crosscut on north lateral drift, 150 feet north of the south line, 600 level, is out 21 feet; face in clay and quartz. The joint south drift from the Ward shaft, 1800 level, is out 215 feet; face in soft porphyry.

WARD SHAFT.—The southwest drift from the shaft, 1800 level, is out 215 feet; face in clay and porphyry.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine a total of 285 tons per day of ore of the average assay value as per battery samples of \$18.56 per ton. The south drift from No. 2 crosscut on the 650 level is in 20 feet, the face showing ore value assay at \$31 per ton. Have advanced the south drift on 750 level seven feet; face in quartz of low value.

Tuscarora District.

NAVAJO.—*Times-Review*, Aug. 14: The upraise has been extended 33 feet and connected. Intermediate crosscut extended nine feet.

COMMONWEALTH.—East crosscut from the bottom of winze below the 4th level has been advanced 23 feet in porphyry; expect to cut the vein in a few feet, slight increase of water.

DEL MONTE.—Third level—No. 1 north drift advanced 25 feet, showing small seam of very high grade. No. 2 north drift extended 13 feet, all in the vein, giving low assays. Have started drift from joint raise.

BELLE ISLE.—Line crosscut, 350-foot level, extended 14 feet, rock not so hard. The winze on the west vein, same level, extended 21 feet. Have started drifting south on the vein in the line crosscut, same level; progress 4 feet, showing good ore. South drift, 450-foot level, extended 20 feet. The stopes are yielding as usual.

NORTH COMMONWEALTH.—Third level. Have started to open stopes from joint raise. Hoisted 13 cars of ore; car sample assay, \$80 per ton. North drift from No. 1 winze east of shaft advanced 28 feet, cut seams of ore near hanging wall assaying \$115 per ton. Fourth level—East crosscut raise extended upward 24 feet into vein formation, giving assays of \$6.41 per ton; water increasing.

NORTH BELLE ISLE.—East crosscut from the south gangway, 400-foot level, extended 19 feet. North drift from the south line, same level, extended 12 feet, ore improving. The upraise on the east ledge, same level, extended 14 feet. West crosscut from the Belle Isle, 450 level, extended 19 feet. South drift, 500-foot level, extended 9 feet, showing some fair ore. West crosscut, 600-foot level, extended 6 feet.

Eureka District.

WILL CONTINUE TO BUY ORE.—*Sentinel*, Aug. 15: An order came from below during the week to the Superintendent of the Eureka Con. Co., to dis-

continue the buying of custom ores. A day or two later this order was rescinded and authority given to purchase ores as formerly. There was talk that the smelters were going to shut down and the company would ship the ores from its own mine to Salt Lake. This story seems to be unfounded. Preparation has been made to ship a small lot to Salt Lake merely as a test and experiment, but nothing beyond this has been determined upon. There is at the works a three month's supply of fuel and ore. It is not likely that there will be any shutting down until this is used up.

Hawthorne District.

LAPANTA.—Walker Lake *Bulletin*, Aug. 12: The stopes above the east drift, No. 6 incline, are showing ores as usual. In the east drift from the winze below the 100-foot shaft level are following down in a vein of high-grade ore, pitching south-west and showing very well.

PAMILCO.—The south drift from the tunnel is being extended on the vein, showing well. The force on the mine has been considerably increased.

CENTRAL.—Are stoping above the 150-foot level and taking out the usual amount of ore. Hauling ore for shipment at present.

MOUNTAIN KING.—The north drift on the main vein is being extended. Ledge is about four feet wide between the walls. On the footwall have about one foot of brown iron, carrying chloride of silver, in which iron, occur large kidneys of solid lead, being very high grade in silver and gold.

FAIRMOUNT.—Drifting south in the main tunnel on the main ledge, and drifting north from the bottom of the winze below the tunnel. All points are producing well.

HARTFORD.—Ledge still continues good, producing a large quantity of heavy lead.

GOLO BAR.—Some ore of good grade is being extracted.

WAR EAGLE.—Are still driving tunnel ahead to tap vein below old workings, and also stoping small amount of ore.

IOA.—Still producing the usual amount of high-grade ore.

NEW YORK.—The south drift on the vein is still being extended; vein strong, carrying some ore, and formation very favorable.

KIT VAN WINKLE (Marietta).—Main tunnel still being extended on the vein, showing about six inches of galena in the face. Are now hauling ore for shipment.

JENNY LIND (Marietta).—Main north drift from the incline is still being extended, the vein showing strong; formation very favorable.

Robinson District.

MINE SOLO.—Eureka *Sentinel*, Aug. 15: The Montana parties have finally made some arrangement looking to the purchase of Watson's Joanna mine at Robinson. The precise terms of the deal have not been given out, but everyone here regards the sale as an accomplished fact. Watson himself says he has sold his mine. The purchasers have gone to San Francisco, presumably to see what can be done with the adverse claim of Mrs. Walcott. It is to be congratulated on the acquisition of a new and strong company.

ARIZONA.

WATER SCARCE.—*Arizona Journal Miner*, Aug. 15: Water is scarce in the Hassayampa now, the supply not being sufficient to keep the Senator mill running on full time. Superintendent Helm of the Tiger M. Co. says that he expects to get the mill in operation within a month. Work is progressing satisfactorily on the new mill at the Catocint mine, and everything looks favorable for the success of the property. A \$775 bar of gold bullion was brought in yesterday from the Quartz Mountain mine. The mill is running steadily now, and regular shipments of bullion are being made. The Commercial M. Co.'s smelter, on Big Bug, is running regularly, turning out high-grade matte, which is shipped via Verde station. C. M. Clark, superintendent of the Alice M. Co., shipped a boiler and engine and other machinery out to the Silver Belt mine yesterday, and will immediately erect a mill on that property to work the ore. The Copper Basin leaching plant will start up in about ten days again. A large amount of ore has accumulated there, and a lead burner has been engaged to remain there permanently, so that the prospects are good for a long run. The concentrates taken to the sampling works from the nine tons of ore from the Mattie Adair mine gave a value of \$206 per ton. This, added to the gold saved on the plates, runs the total value of the nine tons up to about \$42 per ton, or just the assay value of it. The new tunnel of the Senator mine is now in about 660 feet. Forty-six feet was run in one week recently. The total length of the tunnel, when completed, will be about 7300 feet, and it will tap the vein at the depth of nearly 700 feet.

IDAHO.

SEVEN DEVILS.—*Weiser Leader*, August 11: Parties who have recently come in from the Seven Devils mines report a very unsatisfactory condition of affairs. In fact nothing to speak of is being done in the mines. The only work now going on is on the Bodie. The owners are putting down a shaft. No mineral is being produced, and so far as any profitable or practicable results the immense deposit is as useless as it was the day nature heaved the mass of silver and copper ore to the surface. The owners of the Standard have done considerable work this season and the present indications are that the mine will rank among the best. In fact everything looks well enough for the future, but is at present discouraging. Something may be done in the way of buying and selling properties this year, but no active mining work will be commenced. The owners of the South Peacock will sink their shaft 100 feet. The failure of the contractors to build the Snake river wagon road has had a demoralizing effect on everyone, and has caused financial loss in many instances. In fact the whole scheme of steamboat, road and everything connected with it has had an uncanny look from the first. Experts who have been looking over the Seven Devils country feel confident and even certain that immense bodies of ore in fissures exist, and wonder that no attempt has been made to get at them. The deepest shaft in the whole country is only 65 feet, on the South Peacock. The wealthy owners of the Old Peacock, Blue Jacket, and various other noted properties, do not seem inclined to do any

thing. The reported sale has not changed the condition in the least, and it begins to look to a man up a tree as though these parties were receiving inducements to keep the country back instead of developing it.

STODDARD.—De Lamar *Nugget*, Aug. 11: The new incline shaft on the Stoddard mine is now down 25 feet on the hanging-wall of the lode. The *Nugget* expert has been up to examine it and has convinced himself that the superintendent, Mr. Ludwig, is on the eve of developing that into a great property. They are in a clay streak which shows very rich in silver and are sacking ore, selected, which we think will go over \$150 per ton. The width of the lode is about five feet, and is all good milling ore. Sixteen bars of bullion, valued at \$32,000, were shipped from the DeLamar mill on the 5th instant, the final cleanup for the month of July. With the previous shipment, worth \$17,500, this makes the mill output for the month of July \$49,500. These figures are not strictly correct, but approximate very closely the amount. The estimated value of ore shipped is \$12,000.

LOWER CALIFORNIA.

AN OLO SILVER MINE.—*Lower Californian*, Aug. 15: Colonel Lane and J. M. Gonzalez, accompanied by Philip Crosthwaite Sr., have returned from a trip to the latter's ranch at San Miguel, 20 miles north of town, where they went to examine an old silver mine. The mine has not been worked for about 30 years. Messrs. Lane and Gonzalez examined the mine as much as possible and brought back with them some ore from the old dump, which they will have assayed. It was impossible to descend into the shaft, which is said to be 60 feet deep, because of the great swarms of bees which flew in and out.

SINCE A. H. Butler secured control of the Butler group of mines in Alamo, he has expressed his intention of forming a stock company to engage in the work of running a tunnel under five of the mines which lie on Tomassa hill. It is calculated that a tunnel beginning at Butler's mill and running straight into the mountain a distance of 2600 feet would tap all five of the mines at a varying depth of from 600 to 1400 feet. The Gen. Torres, the richest mine of the Butler group, so far as is now known, would be encountered at the latter depth, and it is fair to presume that a considerable ore body would be found.

MONTANA.

DOG TOWN DISTRICT.—*Helena Mining Journal*, Aug. 15: Samuel T. Green, who has been some months in the East, is again in Montana caring for the mining interests under his charge. Enroute to Helena he visited the Summit mine, in the Dog Town district, Jefferson county, the property of the Windsor Mining Co., and is enthusiastic over the work accomplished during his absence and the improvement made in the mine. The incline shaft has reached the depth of 225 feet, the ore body constantly increasing in quantity and quality. He brought in some fine specimens of hard iron-lead carbonates suggestive of the ores of Iron Hill, Leadville. Two cars of ore are now on the road to the sampling works at Helena, where they will be sampled and sold on bids. Not far from the Summit is the Ruby mine, now shipping 80-ounce ore from a body 73 feet in width. There are many leads in the district, but there has been but little development.

TOSTON SMELTER.—Arrangements are complete for blowing in at the Toston smelter. E. B. Northrup has been actively engaged securing ore, and it is thought that enough is now on hand and in sight to insure a continuous run. The outcome of this enterprise is of great importance to the ore-producers of the State.

MULLAN, BURKE AND WARONER.—Over 400 men are employed around Mullan. At least half of these receive \$3.50 per day, the others \$3. This amount equals a pay-roll of \$33,800 per month. The pay-roll at Burke and vicinity is estimated at \$50,000 per month, and at Wardner \$60,000. The census of June showed the population of Mullan and Wardner to be little over 800 for each. A pretty good pay-roll for places of that size.

WASHINGTON.

LOCATIONS.—*Conconully Outlook*, Aug. 12: From Saturday, July 25th, to August 1st, inclusive, or a period of eight days, there were 40 location notices recorded in the auditor's office. Mr. Otto Jeldness returned Wednesday from Portland accompanied by Samuel B. Gillette, the well-known mine operator and expert, and together are looking over the different mining districts of the county. The owners of the Rainbow, which has recently gained considerable notoriety as a gold prospect, have commenced sinking a shaft at the point where they discovered the pocket of free gold about three weeks ago. Parties who have just come in from the claim state that they are taking out some very rich ore, and that their pay streak is widening out as they go down.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAD—San Francisco.
R. G. BAILEY—San Francisco.
BEN THOMSON—San Francisco.
GEO. WILSON—Sacramento Co.
J. H. CROSSMAN—San Bernardino Co.
CHAUNCEY A. DAYTON—Montgomery Co.
E. H. SCHAEFFER—Northern California.
WM. M. HILLARY—Oregon.
CHAS. WILLIAMS—Arizona.
GANO KENNEDY—Nevada.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 11, 1891.

- 457,758.—SPECIMEN BOX—C. M. Bryant, Seattle, Wash.
- 457,703.—CAR-WHEEL AND RAIL.—F. W. Choate, San Diego, Cal.
- 457,544.—WAGON BRAKE.—F. W. Dohbel, Purissima, Cal.
- 457,437.—PROPELLING VESSELS.—H. P. Holland, S. F.
- 457,438.—CONSTRUCTION OF SUBAQUEOUS STRUCTURES.—R. Hunt, S. F.
- 457,724.—HOSE COUPLING.—W. L. Johnson, Pomona, Cal.
- 457,538.—PEA SHELTER.—E. C. Moulton, S. F.
- 457,748.—SPOON.—W. S. O'Brien, S. F.
- 457,519.—CRUTCH.—Klaus Olsen, S. F.
- 457,520.—DETONATING TOP.—E. D. Pike, S. F.
- 457,549.—SAW SET.—Isaac Smith, Fowler Cal.
- 457,682.—TROUSERS FLAP SUPPORTER.—C. S. Terpening, Prescott, Wash.
- 457,388.—VEHICLE RUNNING GEAR.—Warenskjold & Burgess, San Diego, Cal.
- 457,543.—HEATING ATTACHMENT FOR GAS BURNERS.—G. A. Williams, S. F.

The following brief list, by telegraph, for August 18, will appear more complete upon receipt of mail advices: August 18.—Pacific coast patents have been granted as follows: California—Edwin B. Dennison, Pacific Grove, fluid pressure brake; Joseph P. Magney, Oakland, sash balance; William Milbourn, Los Angeles, device for utilizing wave force; James R. Phelps, Sacramento, harness; William J. Rogers and J. Howe, Laurel, in-vented tooth for saw; Charles R. Sahn, St. Helena, dental articulator; Richard D. Schroeder, San Francisco, machine for shelling liquids; Paul Seiler, San Francisco, locomotive; Francis V. Simmonds, San Francisco, pump; Edward T. Stoen, San Francisco, window chair; Oliver Vannorman, Los Angeles, carburetor.
Washington—Edward F. C. Hunsard, Colfax, brush; Fred Lundberg, Tacoma, water-wheel; Thomas W. Moore, Plandfield, N. J., assignor to T. W. Moore Jr., Fair Haven, harness.
Idaho—Thomas Rowe, Ketchikan, jigger.

Notes.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WAGON-BRAKE.—Frederick M. Dohbel, Purissima, San Mateo Co. No. 457,544. Dated Aug. 11, 1891. This invention relates to that class of wagon-brakes in which the swinging brake-bar is operated by connections with a rock-shaft which is itself operated by the brake-lever in front and intervening connections. Novel means are used for adjusting the brake-mechanism to compensate for the wear upon the brake-blocks. The object of the invention is to provide for a greater throw-off of the brake-shoes from the wheel than is usual, and at the same time to use a powerfully acting block; and a further object is to provide a simple and convenient means for adjusting the brake-mechanism when desired.

PEA-SHELTER.—Edward C. Moulton, S. F. No. 457,538. Dated Aug. 11, 1891. This improved apparatus for shelling peas is especially designed for use in families and for operating on small quantities. It consists essentially of a central shaft or cylinder, having radially projecting pins or spokes fixed therein, an exterior concentric enclosing drum journaled upon the projecting ends of the shaft and having its surface pierced with holes for the escape of the peas, a stationary exterior inclosing case or cover, in conjunction with a chute inclosing the lower portion of the drum by which the peas are received and discharged, and a combination of gearing by which the interior hub and pins are rotated in the opposite direction from the inclosing perforated drum. When the peas have all been shelled and discharged, the cover is thrown back, the removable section of the drum taken out, and by turning the drum downward and oscillating the drum once or twice, the hulls of the peas will all be discharged and can be removed, leaving the drum ready for another charge. No ribs or projections are needed upon the interior of the drum, there being a sufficient frictional lifting power to hold the pods against the revolution of the interior pins or arms for the purpose of breaking the pods and shelling out the peas without otherwise destroying the pods or breaking and splitting the peas.

Eastern Metal Markets.

By Telegraph.

New York, August 20.—The following are the closing prices the past week:
Silver in Silver in London. New York. Copper. Lead. Tin.
Thursday... 45 99 12 00 4 45 19 85
Friday... 45 99 12 05 4 45 20 00
Saturday... 45 99 12 05 4 45 20 00
Monday... 45 99 12 00 4 45 20 10
Tuesday... 45 99 12 00 4 47 20 20
Wednesday... 45 99 12 00 4 47 20 20
Quicksilver is steady at 60c. Borax is dull, weak. Buyers independent with approaching large lots via the Cape. Concentrated, 75c; refined, 80c in car lots. Copper appears to have a steadier tone. Tin is firm. Lead is fairly strong.

Sales at San Francisco Stock Exchange.

THURSDAY, August 13, 9:30 A. M.
300 Andes... 1.20
1100 Best & Belcher... 3.45
100 Bodie... .50
1500 Bullion... .75
200 Bulwer... .20
200 Chollar... .20
1245 Con Cal & V... 6.50
100 Crown Point... .35
100 Gould & Curry... .30
200 Iowa... .50
50 Justice... .50
300 Kintuck... .30
400 Mexican... 2.35
100 Occidental... 1.05
750 Ophir... 3.00
300 Overman... 1.60
200 Peerless... .50
200 Potomac... 3.25
300 Savage... 2.30
500 Selkirk... .80
150 Sierra Nevada... 3.00
200 Utah... 2.40
500 Utah... .75
50 Yellow J chief... 1.00

Mining Share Market.

The mining share market the past week was of such a choppy character that the few dealers that are left found it hard sailing. Unless a change is made soon, the majority, if not all of the small dealers will be founded. On Saturday and Monday, under the leadership of Con. Virginia, the North Ends made an advance, but the other groups either remained steady or else shaded off. On Tuesday, Savage spurred up, but the move was short-lived, as usual. Since Tuesday, the market fluctuated downward, with Potosi suffering the most. The action of this stock seemingly gives color to the belief among many that the pool was disappointed in selling it off, when a strike was reported to the East. Well-informed miners do not look for much from the east drifts, but they do expect good results from drifts run to the west, for the West or Red lode, after which they will run lateral drifts and then crosscuts for working. As this will take both time and money, it is human nature for the pool to try and deal out the stock by false moves based on work to the east, and if successful in selling out enough, then commence drifting west for the Red lode, and make outside shareholders pay the expenses. The pool is educating the public to look for nothing but assessments, while the mines are being looted, and consequently the latter is learning to sell when a profit is in sight, and very often even when netting a loss, for the fear of sustaining still heavier losses. Under these circumstances, it is hard to make a successful deal. It now looks as if to make a successful deal, the tactics must be changed in such a way as to inspire confidence.

The share market opened this (Thursday) morning dull and weak, after the call prices shaded off under light trading, but toward the close there was a stronger tone. It looks as if the little stock that was sold on the last spurt has about been taken back at lower prices, which, if the case, the pool will make another up move very soon. We still adhere to our previously expressed opinion that this is an up market, but setbacks must be expected.

Last week's letter from Con. Virginia was a decided improvement on former letters. It gave more detailed information.

From the Comstock mines our advices report that in Con. Virginia, on the 1800-foot level, they had run into lower grade ore, with the ledge more broken. This does not indicate but that they have higher grade ore on that level. On the 1700-foot level connection will be made soon with Best and Belcher. Experienced miners look for good results when they start drifts to tap the upward continuation of the rich ore taken out on the 1200-foot level near the Best and Belcher. After they strike the ore they may have to make air connections before crosscutting or making developing work. The work in Sierra Nevada ought to be approaching an interesting point, as is that in Union on the 900-foot level. In Best and Belcher more interesting work, if not started, ought to be commenced soon. In Savage and Hale and Norcross a large amount of exploiting is under way. Judging from Virginia City papers, we should think that the Potosi and Bullion managements are about ready to set the "world on fire," but it may be all cry and very little wool unless they change the work. In Alpha, Exchequer, Con. Imperial, Yellow Jacket, Confidence and Challenge, the usual work is reported. In Crown Point work is resumed on the 500-foot level. In Belcher they have made a strike, but it is, of course, no good for it is water, yet even this sometimes leads to something better. Overman continues to report low-grade ore. It seems as if they have had time to get the stock back which was sold at higher figures several months ago.

From the outside mines our advices are very favorable from the Bodies and Tuscaroras. In next month they will begin to crush more ore.

The Drexler crowd of operators are outspoken in their belief that no new discovery of ore will be made on the Comstock, and while acting on this impression they do not buy, but sell on every jump in prices. Their views are said to be grounded on the unpropitious time of the year for a deal, and unless the times are favorable there is no use of making a new strike; besides, they say that to make a development now would operate against expected silver legislation in the 52d session of Congress. Mr. Drexler and his followers, it is said, have heretofore been quite successful in their bear moves against the pool.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 30.	WEEK ENDING August 6.	WEEK ENDING August 13.	WEEK ENDING August 20.
Alpha.....	.70	.85	1.00	.70
Andes.....	.65	.65	.75	.40
Alta.....	1.00	1.20	.95	1.00
Best & Belcher.....	1.25	1.75	1.30	1.65
Bodie.....	.60	.65	.60	.50
Belle Isle.....	2.20	3.00	2.75	4.25
Best & Belcher.....	.70	3.15	3.55	4.40
Bullion.....	.60	.80	.70	.60
Bulwer.....	.30	.35	.30	.25
Commonwealth.....	.45	.50	.40	.35
Con. Va. & Ophir.....	.50	6.25	6.00	7.62
Challenge.....	1.20	1.30	1.20	1.30
Chollar.....	1.70	2.00	2.65	2.80
Confidence.....	.30	.35	.40	.45
Con. Imperial.....	.15	.10	.15	.10
Crown Point.....	1.10	1.00	1.25	1.30
Crocker.....	.05	.10	.10	.10
Del Monte.....	.05	.20	.30	.30
Exchequer.....	.50	.70	.75	.90
Grand Prize.....	.05	.15	.15	.15
Gould & Curry.....	1.30	1.60	1.30	1.60
Hale & Norcross.....	.70	2.55	3.00	2.15
Julia.....	.15	.20	.25	.25
Justice.....	.45	.60	.65	.65
Kentuck.....	.25	.35	.30	.30
Lady Wash.....	.45	.45	.45	.30
Mexican.....	2.15	2.65	2.15	2.90
Navajo.....	.25	.50	.55	.55
North Belle Isle.....	.55	.60	.65	.65
Overman.....	.20	.20	.20	.20
Occidental.....	.95	1.25	1.15	1.20
Ophir.....	.35	3.35	3.00	3.50
Overman.....	.20	2.80	2.25	2.15
Potosi.....	.60	4.25	4.60	6.00
Peerless.....	.10	.10	.10	.15
Peavee.....	.15	.20	.20	.20
Savage.....	1.30	2.55	1.75	2.20
Sierra Nevada.....	.80	1.10	1.15	1.05
S. B. & M.....	2.40	4.20	2.80	3.70
Sierra Hill.....	.25	.20	.25	.25
Scorpion.....	.35	.45	.40	.35
Union Con.....	2.05	3.25	2.85	2.75
Yellow Jacket.....	.70	1.10	.80	.95
Yellow Jacket.....	1.50	1.95	1.50	1.90

* Assessment added.

MECHANICAL PROGRESS.

Cupola Practice.

The cupola is a furnace to melt iron, in a foundry. It has been known for centuries, and is carved on Egyptian monuments 4000 years old. The founders of that time are represented using bellows very much similar to ours, to produce the strong blast necessary to melt metal. The metal to be melted was thrown on the top of a pile of fuel which had been previously lighted. The blast was then introduced at the bottom, through one or more pipes or ducts called tuyeres. This is what we are doing yet, in the modern cupola.

Some of the old cupolas were made of stones, some of wooden staves, some of bricks hooped like barrels, and were lined inside with stone, fire-clay or refractory sand; later they were made of cast-iron staves, and only recently of boiler plates riveted together. It is but lately that special study has been made of the proportional dimensions of the cupola.

At the present day many large cupolas are used for small meltings, and small ones for work much larger than their true capacity. The proportions and sizes of the furnace, the quantity and quality of fuel, metal and flux, and the quantity and intensity of pressure of cold or hot blast produce different results.

In the smelting furnace, the iron ore is transformed into pig iron.

In the Catalan furnace, wrought iron is produced directly from the ore.

In the foundry cupola, pig iron and scraps are melted to be cast in molds to make castings.

In the steel works, the molten metal from the cupola goes to the converter to be transformed into steel.—*Scientific Machinist.*

WHAT IS DUE TO MACHINERY.—It is a question whether many perious have formed any correct idea of the difficulties which were met with 60 to 70 years ago, in making suitable tools and machinery from metal. There were no planing, boring, or shaping machines; the turning lathe and the drill-borer were about all the devices which could be called into use by the mechanic of that time. Inventors had to make by hand the machines they invented, with the aid of other machines in making the individual parts. They had to invent some tools so as to be able to make certain parts of their invented machine. When our celebrated machinist, Clement, entered a shop as master at London in 1814, he found the tools so poor and defective that he had to spend days in making such ones as were needed. James Watts, the inventor of the steam engine, could not get his first machines in working order in consequence of a lack of some contrivances. The first cylinder which he had cast was not tight, and was on one end five millimeters wider than on the other. A good cylinder should not show more difference in width than one-half millimeter. And the cost of work at that time was extravagant. Whitworth, one of the oldest manufacturers of working machines in this country, said that the polishing of cast iron cost 12s. per square foot 40 years ago, as the work had to be done by hand. The manufacturer, Perry, paid for the first steel pens about 5s. a piece, but still these pens were not as good in quality as those which are made to-day. After factories had been established, the price of a steel pen was about 4s. 6d., then 2s. 6d., and then 1s., which price was kept up for some time. To-day one can get a gross for that price; all owing to our perfect machinery.—*London Machinery.*

THE TESTING OF IRON AND STEEL.—If a fracture of iron gives long, silky fibers of leaden grey hue, the fibers cohering and twisting together before breaking, it may be considered a tough, soft iron. A medium, even grain mixed with fibers is a good sign, a short, blackish fiber indicates badly refined iron. A very fine grain denotes a hard, steely iron, apt to be cold short, and hard to work with the file. Coarse grain with brilliant crystallized fracture, and yellow or brown spots, denotes a brittle iron cold short, working easily when heated. The iron welds easily. Cracks on the edges of bars are a sign of hot short iron. Good iron is readily heated soft, under the hammer, and throws out but few sparks. Nitric acid will produce a black spot on steel.

THE VALUE OF MECHANICAL PAPERS.—It is astonishing to find, at this time of the world's advancement, so many mechanics who do not read the mechanical papers. A trip through the different sections of the country will reveal some startling facts in this direction, though the papers are penetrating farther and farther each year. Many men in cities, as well as the out-of-the-way places, neglect the opportunity that is offered by any first-class paper of becoming acquainted with the current thought and the latest developments of mechanics at a remarkably low figure, considering the value received. Not only are we brought in contact with the latest and best practices, but are afforded an opportunity not otherwise to be obtained, of becoming familiar with the latest types of machinery for all purposes. It is a valuable educator to be shown the new machines as they are brought out, and the descriptions make their actions intelligible to all that read carefully and study the data that help so much to make a machine plain to the

reader. This lack of interest is not confined to the shop, but extends to the proprietors of the same. One would naturally think that it would be of almost vital interest to the owner or manager of an establishment to keep up with the times, and know what others are doing in the same line; it is easy to get behind the procession, but not so easy to catch up again. It is not necessary to say that the reading man, mechanic or otherwise, is the one that not only enjoys life, but keeps abreast of the most advanced thought and practices in all directions.—*American Machinist.*

A RECENT MECHANICAL INVENTION claims to meet the well known difficulty which often presents itself in the riveting of boilers, namely, the bulging of the rivet in the center, resulting not only in the separation of the plates, but sometimes in the splitting of one or both of them. In order to obviate this defect—wholly, it is said, very seldom becomes known until the boiler is in actual use—a rivet has been contrived which has a thinned waist, to allow for expansion, and the nucleus of the burr already shaped. By this arrangement the burr is practically started before it receives a blow, and the fiber of the metal is already inclined toward the position it will be ultimately forced to assume. The effect or result of this change of form is that the rivet holes become properly filled with the slightly expanded waist of the rivet, the plates are closely united, the burr is well formed, and there is no danger of the plates cracking, the riveting being also effected with fewer blows, thus economizing labor.

BRIGHT DEVICE FOR FIXING A PROPELLER SHAFT AT SEA.—The emergencies of marine disasters often tax the genius of engineers to an extreme, and the manner in which a large British steamer, with a broken propeller shaft, was set right not long since at Algiers, is worthy of preservation in mechanical history. Both the shaft and the tube through which it passes at the stern were broken, and the vessel lay in port until the arrival of another shaft and tube from England. It was then found that the tube was larger than the opening in the stern. The tube was fastened to one of the coupling faces of the sound portion of the shaft, just as it would be hooked in a lathe. The ship's engine was run slowly, and by means of an improvised slide rest, the tube was turned down to the proper size. The tube and shaft were fitted in place, and the steamer resumed her voyage without having been placed in dock, the stern being raised out of water by shifting the cargo forward.—*Scientific Machinist.*

WIRE FINER THAN HAIR.—We are at work just now, said a correspondent of an exchange the other day, on some pretty small wire. It is 1-500 of an inch in diameter—finer than the hair on your head, a great deal. Ordinary fine wire is drawn through steel plates; but that wouldn't do for this work, because if the hole were away ever so little it would make the wire larger, and that would spoil the job. Instead, it is drawn through what is practically a hole in a diamond, to which there is, of course, no wear. These diamond plates are made by a woman in New York, who has a monopoly of the art in this country. The wire is then run through machinery which winds it spirally with a layer of silk thread which is .0015 of an inch in thickness—even finer than the wire, you see. This wire is used in making the revolving instruments of ocean cables, the galvanometers used in testing cables and measuring insulation of covered wires.

A FEW THINGS BRIEFLY PUT.—A correspondent of the *Scientific Machinist* writes: If the few points given below will be considered useful to your readers, I shall feel that this letter has not been written in vain. In grinding and setting tools for lathe, planer or any kind of machine work, give the least possible clearance to the heel of the tool. Always have the cut on the top or front of tools. In boring castings with blow holes, have the face of the tool wide, so that it will have a bearing on solid metal while passing over blow holes. In grinding flat drills, do not have a thick point, or sharp side, as a thick point will not follow the center and will work hard. There is no more strain on the point of a drill than there would be on a drill the size of the point. The sharp sides of a drill will make the hole larger than the drill calipers. Give the least possible clearance to the end of the drill, and you will find that it will stand hard work.

STEEL AXLE BOXES.—A foreign firm has recently patented a machine which does away with a large annual loss by making a wrought-steel box that is not expensive. The steel is delivered to the machine in plates a half-inch thick, and the box is produced by a series of presses which cut the metal to the required shape, and the machine then folds the pieces to form the box. The boxes are much stronger and much lighter than the old-style cast-iron boxes.

WELDING WIRE CABLES.—A Brooklyn cable road has employed a welding machine to join the sections of its cable, and it has found that the tensile strength of the cable is greater at such junctions than anywhere else.

There are nearly 6000 pieces in a modern locomotive.

SCIENTIFIC PROGRESS.

The August Meteors.

During the past week the earth has passed through what has for many years been considered a zone, or belt of meteors, which revolves around the sun in a very elliptical orbit, extending, in its apophelion, to a distance in space far beyond the orbit of Neptune, our outermost planet. This belt or zone is not simply a cluster of meteors revolving around the sun as a planet does, but it is a belt or stream every portion of which is filled with meteors—more dense or in greater numbers in some parts than in others. At each annual revolution of the earth our planet plunges into and passes through this stream of meteors. The time occupied in this passage is from three to five days, less or more, and as the earth moves at the rate of 68,000 miles an hour, the width or depth of this space must be many millions of miles.

Two Great Meteor Belts.

As is generally known, we have what we call the August meteors and the November meteors. The long time intervening between the two indicates that there are two of these great streams. The display of meteors in some years is much greater than in other years; hence it is naturally inferred that there is a great irregularity in the density of these streams, as the earth necessarily encounters them each year at quite different and distant points. When the earth passes through a dense portion of the stream, the meteoric exhibition is really wonderful. In some years, as in 1833, for instance, the heavens seemed alive with meteors for several hours, hundreds being in sight at every moment of time. The distance of these meteors from each other, when in a dense portion of the stream, has been computed as not more than 100 miles, perhaps much less. The November stream is considered the largest and most dense.

The First Recorded Appearance

Of these annual meteoric displays was A. D. 811. They have appeared with great regularity down to the present time, with the exception of a break of 83 years between 841 and 924, and another of 310 years between 933 and 1243. These failures may have occurred from breaks in the ring or possibly a failure to record or notice their appearance.

There Are Many Smaller Belts.

Careful observations have shown, quite conclusively, that the earth passes through something like 100 of these meteoric streams each year—all except the two first noticed being extremely small; but yet quite well defined by careful observers. The orbits of most of these streams have been carefully calculated by astronomers. In addition to the well-defined streams, every portion of space through which the earth moves contains meteors in greater or less numbers. There is not a clear night in the whole year on which many meteors may not be seen. It has been estimated that not less than 400,000,000 meteors are encountered by the earth during each annual revolution around the sun.

What Are Meteors.

It is well known that meteors are fragmentary portions of matter, similar to that of which the earth is composed, and that they revolve, like the planets, around the sun, in more or less elliptic orbits. They are invisible until they enter the earth's atmosphere, when the friction of the air produces great heat, which renders them luminous. By far the greater number are so exceedingly small that they are converted either into vapor or dust in a second or two. It has been calculated that fully 20,000 tons of meteoric dust fall upon the earth's surface every year. The velocity of meteors is generally very great—much greater than that of the earth. Like comets, they move in all directions, and appear in every portion of the heavens. Whether they are fragments of disrupted comets or planets or simply aggregations of cosmic matter, will probably never be determined. But that they are made up of matter such as constitutes our earth is quite certain.

They Vary Greatly in Size.

From a few grains or less in weight, up to immense bodies of from a few feet to many thousand feet in diameter. No line of demarcation can be shown between the tiniest "shooting star" and the largest meteor. They differ from each other in size, color, composition and velocity. When they fall to the earth, they are termed "aerolites." One of the largest aerolites yet discovered weighed 1,635 lbs., and is preserved in the museum of Yale College. One has been found in Siberia, consisting almost entirely of iron and nickel weighing nearly a ton. The National Museum of Brazil contains the largest aerolite known, which weighs 11,800 pounds. It may be considered a little singular that of all the aerolites which have fallen on land and sea, there is only one record of any fatality to man or beast.

CHEMICAL PROGRESS.—In no department of science is there a greater indication of progress than in that of chemistry. This has become a fact largely from the circumstance that the recent progress of chemistry has been so great as to force its way into nearly every economical industry. There is at this day scarce an indus-

try carried on upon a large scale which does not require the constant presence of a chemist. One of the latest achievements in this direction is the artificial production of musk, a process for the successful production of which it is said has lately been brought forward in Germany, and of a character such as to give to the article a positive commercial value. It appears in crystals of a yellowish white color and of a strong musk odor. For perfumery purposes the crystals are dissolved in alcohol, with the addition of a trace of ammonia or carbonate of ammonia. This solution, which is compared to tincture of musk, is described as surpassing the latter in the intensity and penetrating power of its odor. The product to be used in perfumery must previously be diluted in a homeopathic manner. In manufacturing this article, the method pursued, according to the official record, is to hold in a reflex condenser toluol or toluene, with one of the following halogen compounds of butyl, viz., chloride, bromide, or iodide of butyl, along with chloride or bromide of aluminum; the resulting product falls back into the water in the still, where it is decomposed and distilled in a current of water vapor.

THE AERIAL OCEAN.—It seems that on the surface of the earth we are living at the bottom of an ocean more than 100 miles deep. It is the aerial ocean, and in some respects it is similar to the Atlantic or the Pacific ocean. It is thought by some of our foremost scientists that there is a well-defined surface to this ocean, on which are great aerial waves, exaggerated forms of what we see on the surface of water. Other scientists, however, believe that the density of the air gradually diminishes in proportion to the distance from the earth's surface, and that the extreme upper limits is indistinguishable. However this may be, we know that the air is a fluid body, that it has weight and elasticity, and that every square inch of it weighs 15 pounds. This means the weight of one square inch at the bottom, reaching up to the top of the aerial ocean. There is, consequently, an immense air pressure on every person, but we don't feel it because the pressure is equal on all sides of us. If it were only downward, it would fasten us to the earth as tightly as a fly caught in a glue pot.

HOW TO PRESERVE FISHES.—Whenever it is possible, fishes should be put into the preserving fluid as soon as they are taken. After remaining in it a few hours it is necessary to take them out, rub off the mucus and make incisions in the belly, and if the fish is large, on the sides, to allow the fluid to penetrate thoroughly. For the first bath a mixture of equal parts of alcohol and water is suitable. The second bath, however, must contain a larger per cent of alcohol—not less than 70. In order to insure perfect preservation, the specimens must be examined every few days until the fluid has completely saturated them. For final preservation the writer prefers equal parts of alcohol, glycerine and water. In this mixture the fishes remain flexible for study and retain their colors longer than in any other fluid known to him. Whenever the preservation becomes discolored and organic matter collects in the bottom of the jar or tank, fresh liquid must be substituted for it. Eternal vigilance is the price of a collection of fishes.—*Forest and Stream.*

MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.—The sixtieth meeting of the American Institute of Mining Engineers will be held at Glen Summit, Lucerne county, N. Y., beginning October 6, 1891. Special discussions are expected on the two following subjects: 1. The Preparation and Utilization of Small Sizes of Anthracite Coal; 2. Practical Uses of Concentrated Iron Ores.

IS THERE A GLACIER IN SAN DIEGO COUNTY? Binning explorers claim to have found a mighty mass of moving ice in a deep canyon on Grayhawk mountain. The formation is about 25 feet thick and 60 feet wide. Immense rocks have been pushed from their beds by the moving of the great ice mass and lie on top of it. Sun does not reach the ice more than one hour a day.

JUPITER A SUN.—The late observations on Jupiter by Seel, Zolner and Browning are said to lead to the conclusion that this largest planet in our system is in reality a sun to its system of moons. The planet appears to be in an incandescent state, self-luminous, and giving off heat in quantities sufficient to afford much warmth to its attendant orbs.

WRITING BY TELEGRAPH, now so much talked about, was tried in France 20 years ago. Signatures were sent from Paris to Paris, and the experiment was considered entirely successful. After that the whole matter was suffered to fall into abeyance.

A NEW GASEOUS COMPOUND, it is said, has recently been discovered by a German professor, which is made up of oxygen and hydrogen. It dissolves metals, and with silver and mercury, it forms powerful explosives.

A NEW MINERAL has been discovered, to which the name sanguinite has been given. It is a bright-red in color by reflected light, and upon analysis is found to contain silver, arsenic and sulphur.

GOOD HEALTH.

Vigor from the Bath Tub.

Nellie Burns, in the *Country Gentleman*, says: I truly believe there is no other agency so good for recuperating the human system from the effects of work and heat during the hot weather as the all-over bath; and no one needs more the benefit of this free stimulant of nature than the hard-working farmer and his wife. He comes from the field at night, tired. His clothing is saturated with perspiration and performed by the attending foul odor. To go to sleep in this condition is uncomfortable, unhealthful and not neat; and yet this is what many do, and when continued for weeks the enervating influence on the system is sure to be felt.

Now, instead of going to bed in such a condition, the tired farmer should be refreshed by a thorough bath, and fresh clothing should be worn during the night. (The day clothing should be hung up in an outer room to air and dry.) Now behold what this bath does: It induces sleep—a sound, sweet, restful sleep. It has a soothing influence on the disturbed nerves throughout the tired body. It is quieting, refreshing, invigorating; and under its influence, on arising in the morning, the body is free from that stiff, tired feeling, which even sleep does not always banish from those who labor hard.

But to no one does this daily, all-over bath give such benefit as to the worn-out housewife. Confined as she is in the warm rooms at such heating work as washing, ironing and baking, and such nerve-wearing duties as caring for a baby and little children, and listening to their frequent cries, she often becomes so nervous and tired by the time the day is over that often in her secret soul she doubts if life is worth so hard a struggle. To such ones I recommend earnestly the all-over bath before retiring, occasionally throwing a handful of salt in the water as an added stimulant. Don't fresh sleeping garments, and see if comfort and fresh life are not to be found in this simple agency.

An abundance of underwear for summer use, so that frequent changes may be made, is a necessity, both for health and comfort. Although this makes the washings larger, they are no harder, as the garments are less soiled than when worn longer.

A PRETTY CUSTOM—LINING GRAVES.—A simple method is in vogue in Buffalo, where most of the openings for interments are in a subsoil of firm clay. The grave is prepared specially for it by being dug four to six inches larger around on each of the perpendicular sides and ends. Evergreen branches only are used for the first or rough lining and for covering over the fresh pile of ground. Hemlock is preferred, as it lays flat and smooth, covers quick, and its deep green is useful for the purpose. No. 16 wire cut in suitable lengths, and bent hair-pin shape, pins into the soil readily and firm enough, and fastens on the flat branches nicely. This is begun at the bottom of the grave, working up thence till reaching the top, where all can be finished off smoothly with the same material, and strings of smilax be added, either drooping down or looped around the grave and caught up by clusters of flowers; or, with this firm and green ground-work, flowers can be employed extra in clusters and bunches in a variety of ways and to any extent. We have seen elaborate work done by using adiantum foliage and choice flowers freely in finishing. In this case, the fern plants were used, the halves of roots back of the green and out of sight.

SNEEZING.—Although sneezing is a purely involuntary act, it is possible in some measure to guard against its attacks. In the case of a fully developed cold, the sufferer must necessarily submit to the infliction; but, as to the sneeze casual, it would appear to have influence only in a listless or weakened condition of the bodily powers. People seldom sneeze when their faculties are in full tension. Great nervous excitement will hardly admit of the relaxation of a sneeze; hence we often find a chrouh, a hall or a theater, filled with an audience ready to indulge on the smallest provocation. They are in the passive and recipient mood. On the other hand, a strong, nervous concentration possesses the preacher, lecturer or actor. His faculties are girded up for the feat before him, and he can, at least, temporarily defy the draughts that make martyrs of some of his hearers.

DEATH FROM A FLY.—A fly caused the death of a man at Vienna. He was walking the street when the insect suddenly took a position on his forehead. As soon as it left, a swelling appeared, which soon after gave the man such a pain that he went to a physician. The doctors said blood-poisoning had set in, and the man died during the night.

DISAPPOINTED.—It is said that Prof. Koch has resigned all the public offices held by him. This step is associated with supposed disappointment over the unsatisfactory results of his discovery of "tuberculin." The Academic Senate will bestow an honorary office upon him, permitting him to lecture whenever he chooses.

MOLE ON FACE.—A hairy mole which is still growing should be removed at once, even at

the risk of some injury to the skin. It is now probably no more than a plexus of capillary vessels, with only a small supply of connective tissue. There is also a likelihood that it has not yet involved the skin. If this be its condition, the skin over the tumor may be reflected in flaps, and the tumor itself strangulated with ligature in one of the usual ways. The flaps should then be replaced, and the result will be a minimum of cicatrix and deformity; but if the veins be allowed to grow, it will become a large, highly vascular, erectile tumor, probably invading and involving the skin, liable to profuse hemorrhage if injured, yet still quite amenable to treatment, though of a less simple kind. The modes of treating such are numerous, and are continually increasing.

USEFUL INFORMATION.

A VESSEL BREAKS IN THE CENTER.—One of the most remarkable mishaps that ever befell a vessel anywhere, recently happened to the schooner *Michigan* unloading coal at Erie street dock of E. L. Hedstrom & Co., in Chicago. While lying at the dock the vessel broke in two with a report that sounded like that of a cannon. At midships the boat is well out of water, while both the bow and stern lie deep in the river, thereby forming a small rainbow. The coal unloaders had taken out the coal from the midships section, leaving it in both bow and stern. The captain had repeatedly protested against the way the work was being done and said that it would break his boat in two, but no heed was paid to his warning. The oak planking was pulled apart and the pine planks forming the deck, either pulled apart or pulled in two by the great force of the collapse. The *Michigan* is one of the largest schooners on the lake, being 271 feet long and 41 feet wide.

MIXING CEMENT.—All cement when mixed with sand to a proper consistence for mortar will fall to pieces if placed in water before setting is commenced. Pressure while setting, or the degrees of thoroughness of mixing, or the gaging the proportion of the water used, and other considerations, may easily effect the results to the extent of 50 per cent, or even more. The use of cold water for mixing is not injurious, only it retards the setting. Sand also retards the setting. Cement by itself would set in half an hour, whereas when mixed with sand it takes some days before it becomes even at all hardened. When one part of sand is added to one part of cement, the strength becomes diminished by about one-half. Two parts of sand to one of cement averages about one-third the strength of pure cement. Slaked lime again retards the setting of cement.

TO PREVENT RAILWAY COLLISIONS.—A simple and ingenious device for preventing railway collisions has been invented by Mr. W. H. Waddell, and it has been successfully tried on a section of the Baltimore and Ohio Railroad. It gives the engine driver warning, conveyed as follows: A secondary track, laid in sections of desired length, is laid inside the regular track on insulated posts, a branch connecting with a battery in the cab. When two trains are in the same section, the circuit is completed, and the alarm given. The cost of the apparatus, including 12 lb rail, will, it is said, not exceed \$700 per mile.

ANOTHER GUTTA SERENA SUBSTITUTE.—Another substitute for gutta serena has been discovered in South America. It is in the form of a fluid of solidifying properties, is insoluble in water, and hardens and softens with cold and heat. It will retain any molded shape, can be cast into very thin sheets, and will take the minutest impressions upon its surface. It is derived from a plant which grows wild in the Conaco district. In its natural state it resembles chocolate in color when dried, though while flowing from the tree it is white.

THE COTTON SEED BUSINESS.—In the year 1880 there were but 40 cotton-seed mills standing in this country. Since that time the number has been increased to 194, with an aggregate capital invested of \$20,000,000, against \$3,500,000 at that time. The antiquated and inefficient machinery in some of the mills has been found to be of no special use, and consequently the mills have been abandoned, and the business concentrated in the better equipped mills. The cotton-seed trust, formed some time ago, acted on this principle, and a number of its mills are thereby idle.

HOPE FOR TELEPHONE USERS.—There is Boston authority for the claim that the Western Union Telegraph Co. intends entering the field against the Bell Telephone Co., as soon as the original telephone patent expires, which will be in the near future. The Bell people say they are protected against competition by the transmitter patent, which has several years yet to run. If these two great corporations should get into a fight the public would be directly benefited by cheaper rates.

COPPER PRODUCTION.—The census bulletin just issued shows that the production of copper in the United States greatly exceeds that of any other country in the world. According to the statistics, the total production of copper in the United States in 1889 exceeded 113,028 tons. At the head of the five chief copper-pro-

ducing regions in Montana, with a yield of \$9,114 tons in 1889. Next comes Michigan with 43,728 tons, then Arizona with 15,794 tons, New Mexico with 1843 tons, and Colorado brings up the rear with 585 tons.

ELECTRICITY.

ELECTRIC SHOE-POLISHERS are coming into practical use and are exciting much curiosity as well as admiration by the glittering effects they produce. The machine consists of one whirling brush, attached to a flexible shaft, which the bootblack applies by hand. But this latest development in the way of a polisher calls for no manual labor whatever. The shoe thrusts his foot into the machine and draws it out, the polishing being completed instantly. The contrivance consists of a heavy base of iron and oak, one on each side of which is a circular brush revolving on a vertical axle. In front of these brushes, and so closely placed that the bristles of the three intermingle, is a third brush, which moves horizontally. The shoe to be shined is placed on a little platform, which slides forward between the first two brushes, and as the third brush gets into its work, the shoe comes out a glossy thing of beauty. The shafts of the three brushes are self-adjusting, somewhat after the fashion of the rocking-horse machines wherewith the inglorious hog is denuded of his bristles; and it matters not whether the shoe that goes between them is of No. 7 calisher or No. 16, the polish comes all the same. The young genius who built this machine has applied for a patent, and is now working on a mechanical "dancer."

ELECTRICAL BATHS are the last new thing in fashionable medical circles, and are said to cure every form of nervous hysterical disorder. The process takes place somewhat as follows. The patient is first divested of all his garments and wrapped in a sheet. Then a jet of cold water is directed on to the head. He is then told to step into a wooden box that closes tightly round the neck. An electric current is now turned on upon the body, and produces an exhilarating effect. There is also an aperture through which the attendant can pass a sponge, forming one terminal of an electric current, the body being connected with the other terminal. This sponge is held on any specially afflicted spot. After the "bath" is over, the patient is thoroughly rubbed and dried, and while the steaming, electrocising and rubbing process is going on, a cold-water compress is kept upon the head to preserve it cool and fresh.

ELECTRICAL TREATMENT OF METALS.—An interesting exhibition was made in Boston, on the 8th inst., of processes of forging and tempering by electricity of obdurate metals. One experiment was the melting into liquid form of a bar of steel an inch in diameter and 12 inches long in 45 seconds without the temperature of the room being raised a single degree from its normal condition. Another thing shown was the making of a steel railroad spike. A bar is cut into the required length. The pieces are then passed through an electrical machine, where one end is heated, and then go to a die, which shapes a head on the heated end, the point being compressed into shape without heating. Another exhibit was the forming of an auger screw, a flat bar of iron being fastened in the machine at two ends and heated almost instantly, and then twisted into the required spiral.

AMALGAMATING GLASS WITH METALS.—Word comes from Vienna that the electrical world is greatly excited over the discovery made by Capt. Franz Walter, the lecturer at the military academy, of a method of amalgamating glass with other metals besides platinum. This invention will revolutionize the manufacture of electric lamps, in which the use of platinum will be entirely discarded, thereby doing away with the principal source of expense. Capt. Walter asserts that by his method lamps can be manufactured 50 per cent cheaper than in the old manner, and that the breakage would not amount to five per cent.

A NEW ARC LAMP.—A new arc lamp has been invented by a Pittsburgh man, which, it is said, has decided advantages over all other lamps. Instead of the carbons being made pencil-shaped, they are made in the form of wheels, which are placed at right angles to each other. One wheel is larger than the other, and by an automatic arrangement within the lamp they are kept constantly revolving. It is said that the lamp is cheaper and simpler than the old-style lamps, while its endurance is greater, the claim being made that the lamp will burn continuously for 500 hours without a renewal of the carbons.—*Industrial World.*

ELECTRIC LIGHTING.—What appears to be an authentic report comes from the chief electrician of the postoffice at London, as to the relative cost of gas and electricity as a means of illumination. His figures show that gas, the equivalent of 4000 candle power, would cost 25 cents, while an arc light of the same power would be but 16 cents, but incandescent light to that extent would cost 50 cents, and taking nine principal English cities for an example, he states that the value of gaslight, as paid per annum by the consumer, would be \$225, while the electric lights would cost \$250 on the same conditions.

ENGINEERING NOTES.

A CURIOUS TYPE OF ARCH CONSTRUCTION.—A late French technical journal describes and illustrates a curious form of arch construction, as applied by the Persians at Khoreabad. These arches have semi-circular, elliptical or ogival sections, and rest on vertical abutment walls of brick. Their peculiarity lies in the oblique arrangement of the brick rings. The ancient masons apparently did not use centers; so they started the first ring against a mass of brick masonry built with a face inclined at about 60° degrees from a vertical plane. All succeeding rings were then supported against this first one, and all had this same inclination from the vertical. They did not use a key-stone, but filled the opening left at the crown with brick clay, firmly rammed. The bricks used were comparatively thin and broad, and were shaped to conform to the lines of the arch. These drainage channels, so named, were evidently well backed originally with earth.

LAYING CONCRETE UNDER WATER.—A simple process of lowering concrete under water by means of what may be called the "continuous hopper," has been used in constructing the piers of the large railway bridge over the Loire. The difficulty was to prevent the contact of the concrete with water before deposition. A tube was suspended by a crab winch resting on the usual framework, and while the lower end rests on the ground, is filled with concrete. It is then raised and part of the concrete allowed to run out and settle itself. This, which is the whole of the process, can be repeated at any part within the framework. It has proved both more effective and cheaper than the old process of depositing by boxes. Neither concrete nor cement can be emptied in water loose with good results, but must be conveyed to place in boxes or bags.

RAILROAD BRIDGES IN ENGLAND.—Many of England's railroad bridges, which were constructed when the equipment was lighter, are considered not strong enough for the traffic now going over them. Sir John Fowler, the engineer who built the great bridge over the Firth of Forth, recently made an investigation on the Brighton railway, and on the strength of his report the company has decided to rebuild half of its bridges. The other railways are represented as being in precisely the same plight. The bridges, Sir John Fowler declares, were built of cast iron for the light rolling stock which was then in use. The present locomotives, however, are so much heavier that they require stronger bridges, constructed of wrought iron or steel.

METHOD OF ACCURATELY MEASURING STRAINS ON IRON BRIDGES.—A French engineer has devised a method of accurately measuring the strains on iron and steel bridges, using for the purpose two brackets, which are attached, some distance apart, to the beam to be tested. On one bracket is a water chamber, closed by a flexible diaphragm, and connected with an open tube, which serves to register, by the height of the tube, any pressure made on this diaphragm. One end of a pointed rod is connected with this metal covering to the water chamber, while the other is suitably joined to the other bracket. It is thus seen that any elongation of the bridge member causes a motion of the diaphragm, and a fall of the water in the fine tube.

THE SUZ CANAL TOO SMALL.—The most important deduction to be obtained from the annual report of M. de Lesseps to the shareholders in the Suez canal, is that the facilities of the water way are rapidly falling behind the enormous increase of traffic, and that before long, probably even the relief afforded by the recent diminution in the time required for transit will be found insufficient. The work of widening the canal is already well under way. About 15 miles of its length has already been widened and the work is being vigorously prosecuted.

THE SOUTH PASS JETTIES.—According to the last report of Major Quinn, U. S. Engineer Corps, shows a 26-foot channel, 50 feet wide, beyond the sea ends of the jetties. Turning to the eastward of this direct channel, however, there is another with a depth of 26 feet for a width of 400 feet and 30 feet for a width of 120 feet. At the head of the South Pass there is a 29 3/4 foot channel, and the 26-foot channel is very wide. In Goat Island Reach the 26-foot channel is 310 feet wide. In Grand Bayou Reach the 26-foot channel is 400 feet wide.

THE CAPE COD SHIP CANAL appears to have taken a new departure with a new charter and new managers, with every indication of its being carried out to its full completion. The canal will be 1000 feet wide. The new company must reimburse the old corporation for all the work done and assume all its liabilities for work done. The work must be completed by the 1st of June, 1895.

A CARD made from aluminum, and which in appearance is as delicate as gold leaf, is rapidly gaining popularity among the general class of business men. It is said to be more durable than anything usually used in such cases, such as celluloid, wood, metal, paper, etc., and is said to be no more expensive.



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G. H. STRONG.

SAN FRANCISCO:

Saturday, August 22, 1891.

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Passing Events.

The Mechanics' Fair opened this week and will continue until Sept. 26th. The number of exhibits is said to exceed that of previous fairs.

The unseasonable and severe rainstorms in the southern part of this State indicate a change in the climatic conditions, brought about possibly by the new lake in the Salton basin of the Colorado desert. It looks now as if the lake, fed by the Colorado river, would be a permanent feature of the desert, in which case, the summer climate of the southern part of this State may be radically changed, with occasional showers and less heat in the interior.

There is nothing of special interest to note concerning the Pine Nut mines, Nev. One good claim is known, but the others are of doubtful value so far.

Rich mineral discoveries are announced at the head of Paradise Canyon, about 25 miles northeast of Ogden, Utah. The ore is very rich in lead, with some silver. The first claim, found by a sheepherder, was sold to the Bullion-Bank M. Co., for \$40,000. Some 300 locations have since been made and many prospectors are on the ground.

The First Cable Road.

It will be remembered that the Trustees of the Mechanics' Institute, at the time of the fair of last year, invited Mr. A. S. Hallidie of this city; the invention of the street cable system, to place on exhibition such models, or appliances as he might have relating to the original road, with a statement of its inception and construction; and also statistics of the application and growth of the cable railroad system. This request Mr. Hallidie complied with, and in the report of the Institute gave a sketch of the invention of the cable railway, describing in detail the original Clay street road, from the inception to completion.

From the small beginning on Clay street in San Francisco, the cable railway system has taken a position of eminence throughout the civilized world. Although the system had been working successfully on Clay street in full view of whoever desired to examine it, three years and a half elapsed before a second line was built. In this connection it may be stated that the first technical description, illustrated, of this first cable road, was published in the MINING AND SCIENTIFIC PRESS, and was prepared by the writer of this paragraph with the assistance of the inventor and engineer of the road.

Since then the construction of cable roads has gradually increased until there were 255 miles of double track in operation in the United States last year. According to the census, San Francisco, however, still retains the distinction of having more miles than any other city in the Union.

The system has been successfully introduced in Melbourne and Sidney, Australia; Dunedin, New Zealand; London, Birmingham and Edinburgh, Great Britain, and in Paris and Hong Kong. The San Francisco systems are rapidly being enlarged.

Mr. Hallidie has published in a little pamphlet his early experiences in designing and building the first cable railroad for the streets of a city, taken from the Mechanics' Institute Report above alluded to. It is of more than passing interest as showing the various steps in the inception and growth of a most useful invention.

Foundry Notes.

Engines for the Electric Railroad.

The Risdon Iron Works of this city have just completed two magnificent engines of 500-horse power each for the San Francisco & San Mateo Electric Railway Company. They have been set up in the shops, and when a representative of the MINING AND SCIENTIFIC PRESS saw them this week they were being taken down preparatory for shipment to the company's new power-house at Sunny Side.

The two engines are precisely alike, one being intended for a relief engine in case the other has to be put out of use temporarily, so there will be no danger of cessation of traffic. Each engine is a triple-expansion, with 15-inch high-pressure, 24-inch intermediate and 38-inch low-pressure cylinders, 48-inch stroke. The high-pressure and intermediate cylinders are fitted with the well-known Corliss valve gear and the low with ordinary slide-valve and Myer's out-off.

The hearings are all fitted with slight-feed lubricators, and the main crank-plans with centrifugal oilers. Each set of engines is provided with a fly-wheel 16 feet in diameter, 31-inch face, the weight of each being about 30,000 pounds. The faces of these wheels are made with grooves for 15 one-and-a-half-inch hemp ropes.

The condensing apparatus for each set consists of one jet condenser 30 inches in diameter and 50 inches high, and one compound Davidson independent air-pump. The steam cylinders are five and ten inches in diameter and 16-inch stroke; air, 14 and 16 inches.

The piping is arranged so that, in case of breakage, either side can be used, and can be run high or low pressure as the case may be. The high and intermediate cylinders are set tandem, and the low is set opposite the high-pressure cylinder.

These two large engines were completed in 46 days from the date of the signing of the contract. All the cylinders are covered with non-conducting material, and are lagged with black walnut. The engines are of first-class material and workmanship, and highly finished.

The Mechanics' Fair.

The Twenty-Sixth Industrial Exhibition of the Mechanics' Institute opened on Tuesday last, the opening exercises being conducted at the Grand Opera-house on that afternoon. These consisted of addresses and music.

David Kerr, president of the Mechanics' Institute, made a brief opening address, in which he referred to the growth of the institution since its organization in January, 1855. He said that at present the library contains 56,000 volumes, with a monthly withdrawal of 12,000 volumes by the 4500 members. In reference to the financial growth, he said the present block on which the pavilion stands was bought in December, 1880, for \$175,000, and all the funds available at that time above indebtedness was \$5000. "The wisdom of the purchase has been demonstrated," he said, "by the fact that recently the institute was offered \$1,000,000, showing a net gain in 11 years of \$825,000. The organization has never received but two gifts—one of \$10,000 from James Lick and one of \$500 from John Center, and its property is so protected by legislation that not \$1 of it can ever be used for private purposes. The Mechanics' Institute and all its interests are held as a trust for the people of the great city of San Francisco."

The oration was delivered by Thomas F. Barry. After referring to the work of the Mechanics' Institute as a factor in building up the mechanical arts in San Francisco, he said the exhibition this year was of more than usual moment, because of the great Columbian Exposition which would soon open at Chicago. "That great event," said he, "will mark an epoch in the history of our great country. It will show the progress of American genius after 400 years of civilization on this continent. All the nations of the earth are invited to bring their best trophies, and this exhibition, the opening of which we are to-day inaugurating, is an indication of what California will be able to show to the world two years hence."

"It needs no statistics to show the grand march of progress in San Francisco or in the State. On every hand the fruits of Pomona, the blossoms of Flora, the deliciously flavored wines, the great manufactories and the happy homes of an industrious, happy people, speak forth the stability of our beloved commonwealth. Each year the evidences of advancement can be seen, and not on the land alone, for on our bay float the highest triumphs of naval architecture. The record of the past and the experience of the present all tend to show that our inventive genius is still in its infancy."

At the pavilion everything is not yet in good working order, some of the exhibitors being, as usual, tardy. By Saturday, however, everything will be in place and the machinery all in motion.

The Arrastra.

The arrastra is one of the primitive appliances for crushing and amalgamating free-gold ores, but none of the modern machines excel it in closeness of work. Were it not for its slowness and comparatively limited capacity, many more would be used. As it is, the arrastra is the "poor man's mill," and there are many of them in use in the gold fields by miners who are working their own claims. They are generally run by horse or water power, and do good work.

On some large properties, arrastras are used for working over tailings which have passed through the ordinary mill, amalgamating and concentrating appliances. In such cases the arrastras are arranged in a row, and kept at work continuously, being cleaned up as occasion demands. The out on the front page of this number of the PRESS (for which we are indebted to the *Overland Monthly*) is one of a string of arrastras on the Yuba river, below a 60 stamp mill. It is 36 feet in diameter and run by water-power, a horizontal wheel being used as shown. Water is taken from the main flume, by branch boxes, and each arrastra has its separate wheel.

These machines are kept running on tailings and catch in gold and quicksilver about \$1.50 per ton. The stuff being already crushed and the machines being large, a large quantity of tailings can be put through. One man and a boy can attend to half a dozen or more arrastras. Large stones are used for drags, and the arrastra is also paved with irregular shaped stones, smooth on the surface. Where there is abundant water power, these machines can be effectively used on tailings, as in the instance cited.

Electric Transmission for Mine Work.

The Australians are quick to adapt new machines and systems in their mining work, and were among the first to utilize electricity for power in this connection. Several years before we had any quartz mills run by electricity in this country, they were running a mill in that way at Skipper's Creek, N. Z. They bought the Pelton wheels and Brush dynamos in this city and set them at work in 1885.

The Australians are about undertaking the largest general plan for using electricity in mining operations that has been conceived. A company is establishing a central plant to generate electricity, which will be sold for power purposes to all the mines requiring it in two mining districts. Both power and light will be furnished. The map on our first page, which we reproduce from the *Australian Mining Standard*, will show the general scope of the plan.

The two mining districts of Dandas and Zeehan, some miles apart, have each many mines and reduction works. At a point on the river between these districts, where water power is abundant, the Zeehan and Dandas Electric Power and Lighting Co., will establish a power plant which will equal 5000-horse power. By means of electric cables, this power will be distributed to the mines and mills in the two districts, for mills, hoists, pumps, etc. This will do away with the necessity of separate power plants for the several mines, and the company expects to sell the electric power for much less than the mines could produce it themselves. A railroad runs down from upper Dandas to the harbor on the coast, and it is possible this may be run by electricity.

There are many places in this country where a plan of this kind would work to the great benefit of the mining districts. A great deal of machinery could be dispensed with at the mines and mills and power could be obtained cheaply, where originally generated by water and transmitted by electricity.

The advantage of the plan is that any neighboring water power can be utilized, even when several miles from the mine or mill, or over a mountain central station for supplying power as is now common in cities. There is even better opportunity in the mining regions where water power is available for operating the dynamos, whereas in cities, steam engines must be the primal motors.

From the sketch-map given, it will be seen that the proposed Australian plan is quite a comprehensive one, taking in as it does, two large mining districts.

The Standard Drill Press.

The outgiven on page 113, shows an improved standard upright drill press, which is made from entirely new patterns and has all the latest and best improvements. The machine is heavily braced from the top to the base at the rear. This feature prevents the column from being forced backward during the strain of heavy drilling. All sliding drill-heads are fitted with the patented quick return, which is operated by the right hand alone, leaving the left hand of the operator free to retain its hold upon the work.

The sliding head is gibbed and balanced thus preventing it from falling when the bolts are loosened. The spindles are balanced to prevent back lash; are made of the best steel and extra as are also the cones and level gears, the latter being cut from the solid. By the improved clutch device the back gears are thrown in and out by a simple lever movement.

The table-arm is raised and lowered from the front, and can be adjusted by the operator without leaving his position. The 25-inch, 32-inch and 40-inch drills are fitted with the new patent automatic stop to the down feed. By this device, any number of holes may be bored to a depth, and it is particularly advantageous where an operator is running more than one machine.

A neat swinging bracket is furnished with each back-gear drill press, in which holes can be bored to hold drills, taper sockets, chucks, etc. An index-plate is also attached, showing speeds at which drills of different sizes should be run for drilling iron, steel or brass. The machines, entire, are very heavy and powerful, the metal being placed in the proper place to give most strength and power. The Parke & Lay Co., 21 and 23 Fremont St., this city, are agents for this machine.

Blast-Furnace Construction.

Continuing our extracts from Dr. Wedding's paper before the American Institute of Mining Engineers, we gave illustration last week of the German practice in blast-furnace construction, as shown in the furnaces at Friedenshütte. On this page, are drawings of the furnace at Horde, in Westphalia, showing the general proportions and arrangement. Dr. Wedding says Lurmann's cinder-notch is universally used. Generally the furnace is closed in front, as a crucible furnace. The old-fashioned fire-hearth occurs, however, when (in the production of Bessemer or Thomas pig) casts are to be made at brief intervals. But in this case, also, the cinder-notch is used, since the interspace of the fire-hearth is entirely closed by tamping. The cut shows this.

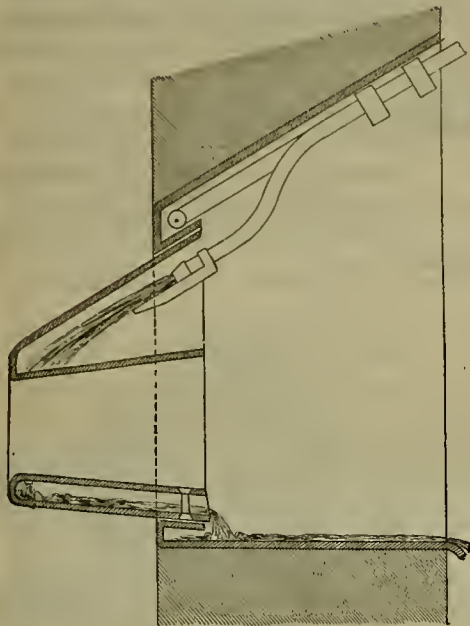
The removal from the furnace-walls of the weight of the tunnel-head, hell, etc., is becoming more rapid and more complete. The closed

at the Horde furnaces, does not, indeed, satisfy the theoretical principle that the gases should be collected only above or only below the stock level; but it has proved itself the best charging apparatus, probably because, by means of the

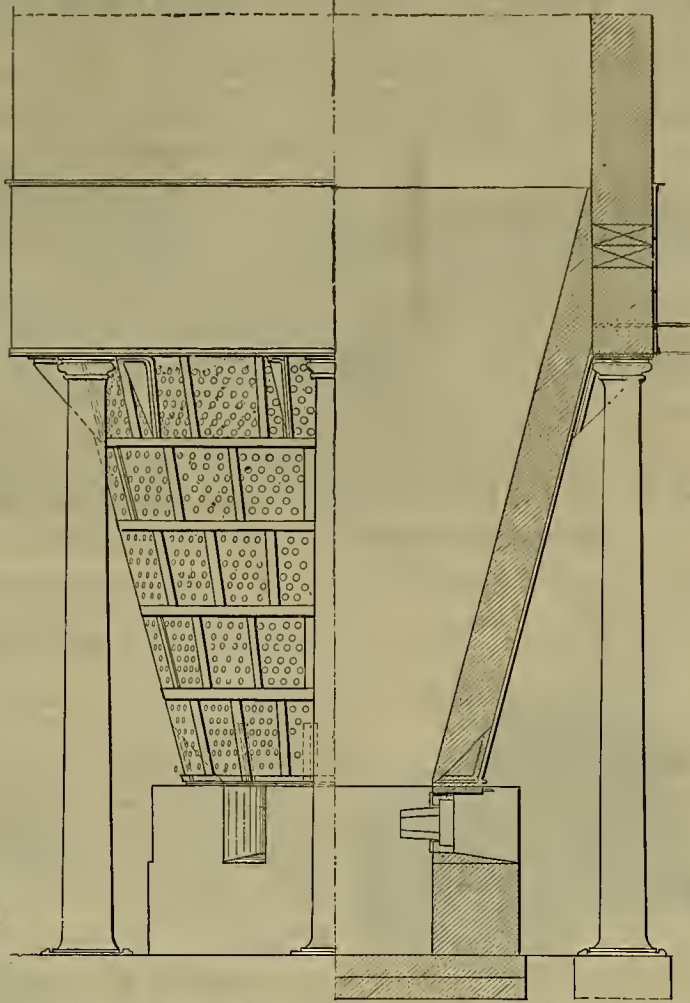
given shows such a construction, but some have gone still further and separated the parts of the furnace walls above the bosh, connecting each by means of a ring and brackets with the supports of the top platform.

with tar and glow-heated (gegluht). These are substituted for the ordinary fire bricks of the hearth, and seem to be well adapted even for the hosh and belly walls. They are likely to find increasing use wherever the blast furnace manager is not troubled with lead and zinc in the ores. The tuyeres are always cooled, but the form first introduced by Hülgenstock at Horde (see engraving) is frequently used instead of the ordinary closed form.

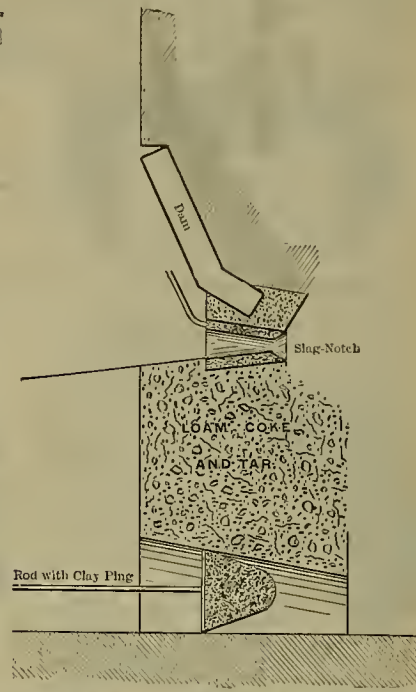
ANACONDA. — Mr. J. B. Haggin of the Anaconda mine, Montana, says that while the copper trade is lower than it has been, it is good enough to warrant the expense of a new and independent line of railroad from the mines to the works. The Montana Union R. R., raised the rates from the mines to the works, from 40 to 60 cents per ton, and Mr. Haggin



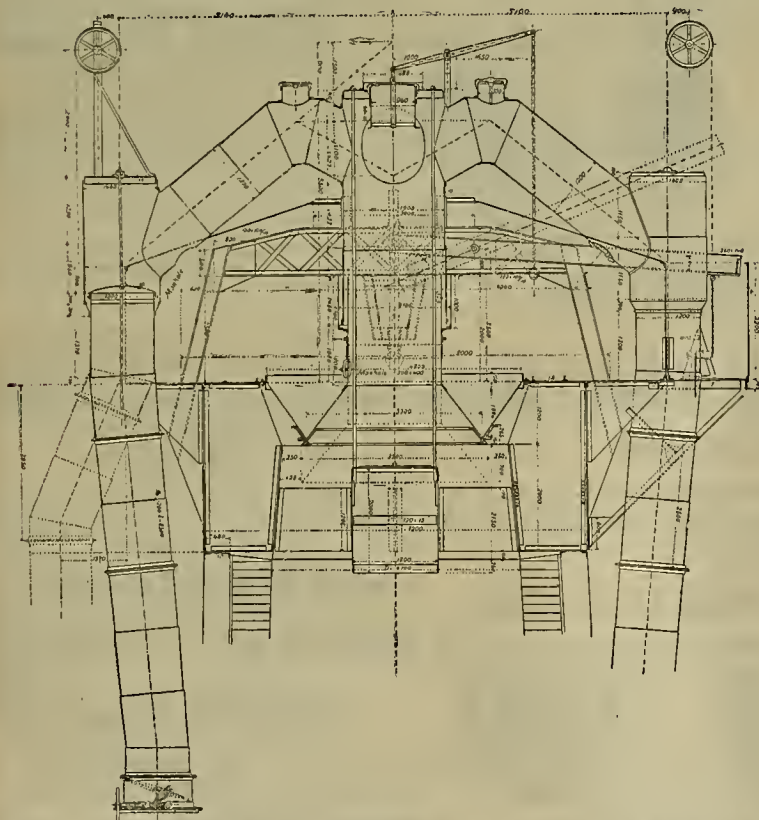
WATER-COOLED TUYERE AT THE HORDE WORKS.



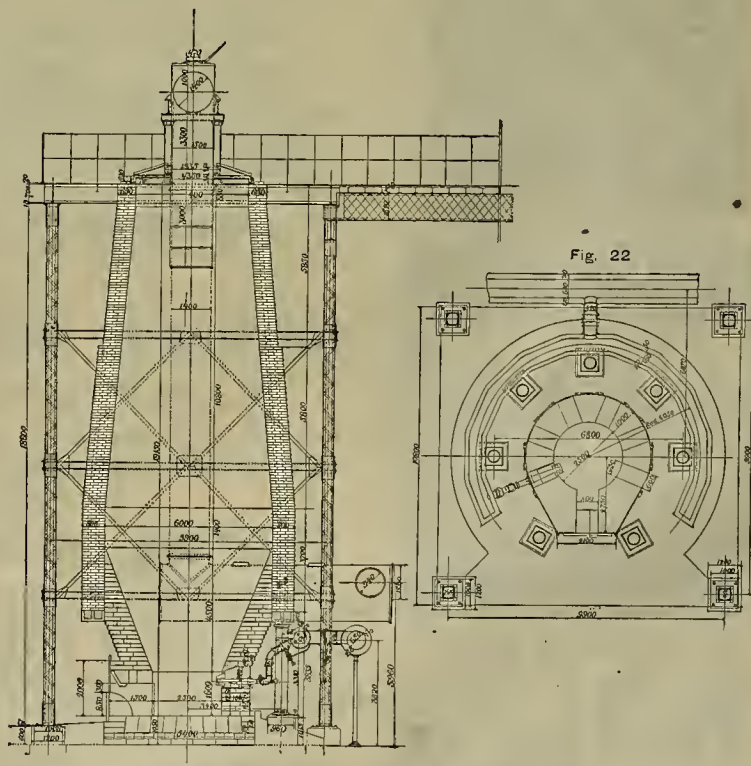
LURMANN'S CONSTRUCTION OF BLAST-FURNACE BOSH AND HEARTH.



FORE-HEARTH, CINDER AND IRON-NOTCHES OF A BLAST-FURNACE AT HORDE.



PARRY CONE AND GAS-PIPE OF BLAST-FURNACE NO. 3, AT ESCHWEILER.



BLAST-FURNACE AT HORDE, WESTPHALIA.

top (for lump ores, usually the Parry cone, shown in the cut, from Lorraine; for fine ores, the Langen hell charger, frequently provided also with an interior suspended gas pipe contracting downward, as shown in cut) is always hung from the top platform and carried by special supports.

The closed top, with interior suspended pipe, suspended pipe, the center of the stock column is most effectively kept loose. At these furnaces the hell is operated by steam.

Lurmann was the first to emphasize the desirability of making the different parts of the blast furnace more independent of one another than formerly, and of relieving the lower parts from the weight of the upper. The figure

The cooling of the hearth is generally very complete from the hosh to the bottom. Yet it seems to have been rendered in part or wholly unnecessary by an arrangement which has been devised by Director Burgers at Gelsenkirchen, namely, the employment of carbon bricks made of retort graphite or of coke dust (containing one to two per cent of ash), molded

closed the mines in consequence. Now there is talk of building an independent road.

CHARLES R. STEIGER, of the firm of Stelger & Kerr, proprietors of the Occidental Foundry of this city, died on Sunday evening. He has been identified with the iron interests of this city since 1852.

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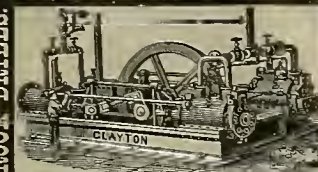
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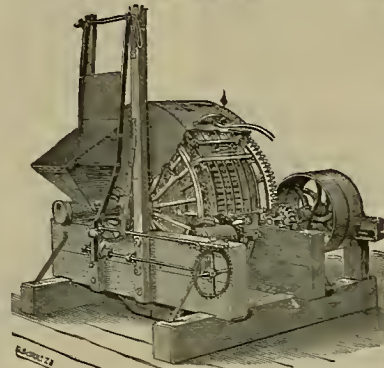
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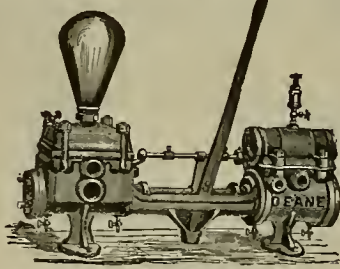
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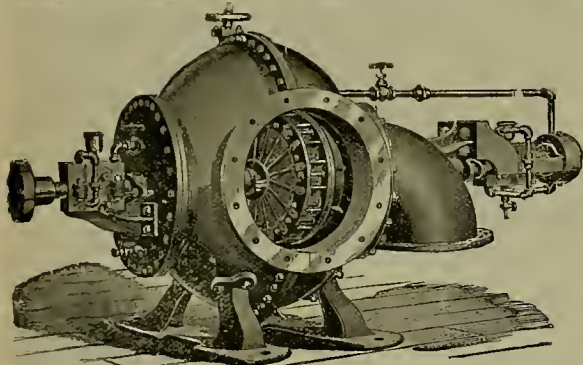
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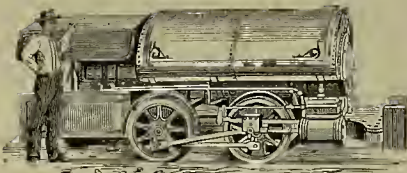
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Bullion M Co., Nevada.....	50	50c.	July 15, Aug 29, Sept 8.	R. E. Grayson.....	331 Pine St
Chollar M Co., Nevada.....	30	50c.	July 14, Aug 13, Sept 8.	C. E. Elliott.....	309 Montgomery St
Challenge Con M Co., Nevada.....	9	50c.	July 31, Sep 2, Sept 23.	C. L. McCoy.....	331 Pine St
Crown Point M Co., Nevada.....	55	50c.	July 9, Aug 13, Sept 3.	J. Newlands.....	331 Pine St
Cruikshank M Co., California.....	2	50c.	July 7, Aug 17, Sept 7.	E. J. Koch.....	211 Sansome St
Exquisite M Co., Nevada.....	31	25c.	July 21, Aug 14, Sept 17.	C. E. Elliott.....	309 Montgomery St
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Golden Jacket M Co., Nevada.....	4	3c.	July 2, Aug 13, Sept 12.	R. G. McClellan.....	331 Montgomery St
Gould & Curry M Co., Nevada.....	67	30c.	July 24, Aug 25, Sept 17.	A. R. Durbrow.....	309 Montgomery St
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Julia Cons M Co., Nevada.....	24	10c.	Aug 16, Sept 16, Oct 3.	T. S. Starfield.....	309 Montgomery St
Justice M Co., Nevada.....	43	25c.	July 11, Aug 15, Sept 4.	R. E. Kelley.....	419 California St
Martin White M Co., Nevada.....	26	25c.	July 21, Aug 14, Sept 21.	A. B. Cooper.....	325 Montgomery St
Mexican M Co., Nevada.....	43	25c.	Aug 10, Sept 14, Oct 6.	C. E. Elliott.....	309 Montgomery St
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New El Dorado G M Co., California.....	2	5c.	Aug 4, Sept 10, Oct 2.	J. W. Pew.....	310 Pine St
Northwestern L & M Co., Br. Columbia.....	3	8c.	July 18, Aug 31, Aug 24.	F. Bonachia.....	433 California St
Potosi M Co., Nevada.....	36	55c.	July 21, Aug 25, Sept 15.	C. E. Elliott.....	309 Montgomery St
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Tekriff Con M Co., California.....	6	1c.	July 11, Aug 11, Sept 5.	W. J. Guertt.....	308 Pine St
Teresa M Co., Mexico.....	9	40c.	Aug 11, Sept 14, Sept 20.	A. Cheminat.....	320 Montgomery St
Tuolumne Co Development Co., Cal.....	1	880	July 10, Aug 12, Aug 31.	C. Hermann.....	332 Kearney St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Humboldt M Co., Nevada.....	G. R. Buddick.....	35 New Montgomery St.	Annual.....	Aug 24
Inyo Marble Co., California.....	G. W. Lucas.....	132 California St.	Annual.....	Sept 10

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Cons Ol & Virginia M Co., Nevada.....	A. W. Havens.....	309 Montgomery St.	50.....	Aug 17
Idaho M Co., Grass Valley.....	Grass Valley.....	3 00.....	Aug 4
Northwestern Gravel M Co., California.....	.....	Grass Valley.....	50.....	Aug 20
North Banner Cons M Co., California.....	J. T. Mitchell.....	Grass Valley.....	50.....	Aug 20
North Commonwealth M Co., Nevada.....	J. W. Pew.....	310 Pine St.	25.....	June 17
North Star M Co., California.....	D. A. Jennings.....	401 California St.	50.....	Apr 8
Pacific Coast Borax Co., California.....	A. H. Clough.....	250 Montgomery St.	1 00.....	Aug 10

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 20, 1891

During the week speculation has largely centered in wheat, and considerable money was made by the bulls. Dealings are increasing, which takes largely from legitimate pursuits. General trade is reported dull in all lines outside of farm products. Iron manufacturers, generally, report active business, with continued orders in hand. More iron is being used for building purposes. The money market is fairly easy, notwithstanding the heavy crops to move. The New York money market is reported as follows: Money is easy for short loans on good security, but distrust and uneasiness are the distinctive features, and this in face of many conditions promising unusual prosperity, such as bountiful harvests, cheap food and increasing railroad earnings, so that "there was never an occasion like the present." The effects are seen in the rigid scrutiny of all forms of security in making loans, and in consequence the best business firms are liable to embarrassment, transactions in commercial paper being confined to very narrow limits. Another consequence is seen in the accumulating reserves of many institutions.

MEXICAN DOLLARS—The market is quiet around 77 1/2 cents.

QUICKSILVER—Receipts aggregate 209 flasks. The market exhibits a healthier tone. The New Almaden Co. is not giving out quotations. This is accepted as a belief in better prices later on.

SILVER—The market has been sold down to 98 1/2 cts. To many the lowering market has proven a disappointment, for with the United States taking 4,500,000 ounces a month, it was only reasonable to conclude that the market would advance. The large wheat, corn, provision and cotton surplus in this country will cause exchange to rule low, admitting the importing of coin at a profit. Probably to this, to a certain extent, attributable the present forlorn by hears of silver to such low figures. If it is the work of the bears, it is possible they may find that they have over-discounted the future. In the local market, there is some inquiry for China and Japan, which is generally a forerunner of purchases by those two nations. The unsettled condition of both politics and money abroad may be having a temporary effect on the market.

BORAX—Overland shipments in last month aggregated nearly 8000 cts. In the local market, combination or pool prices quotations remain unchanged, but concessions are said to be obtainable from others.

LIME—Receipts the past week aggregated 3689 bbls. The market is essentially unchanged.

IRON—The market is about the same as reported last week. Spot supplies are lessening, but free shipments on the way are against the selling interest. The consumption in this State and up North shows a steady gain.

TIN—Nothing doing. Pig is easy, but plate is firmly held, notwithstanding the stock is large. At the East weak holders have been cleaning up. Welch makers are not pushing production.

LEAD—The market is quiet but steady. The East reports a strong market with free sales recorded, under confirmed advices of moderate.

COPPER—The market is well expressed by the following from Iron Age's report of the New York market: At the 12 cts, several hundred thousand pounds, according to current report, have changed hands; and it is claimed also that a moderate quantity was placed for future shipment at or about 12 1/2 cts, delivered. Between secrecy observed by principals and the rather peculiar plans adopted by some influential operators, actual market value is shrouded in mystery and the maneuvers would lead to the belief that special efforts are making to prevent a decline or to cause it to come slowly.

COKE—The market is steady at current quotations.

COAL—Imports the past week aggregate as follows in tons: Nanaimo, 3909; Seattle, 3910; Port Townsend, 1900; Coos Bay, 450; Departure Bay, 1388; Comox, 4000; Tacoma, 2850; Newcastle, N. S. W., 2632. Total, 23,089 tons. As will be noticed, coast coal is arriving more freely. The registered tonnage loading and on the way to this port from Australian ports is 57,631 tons from Newcastle, and 14,805 tons from Sydney; and to San Diego, it is 11,955 tons from Newcastle. Total, 84,391 tons register. From Europe and also from the East, considerable coal is on the way. It is said that for spot and near-by, the market shows more strength, but with no advance established.

San Francisco Metal and Coal Market.

THURSDAY, August 19, 1891.

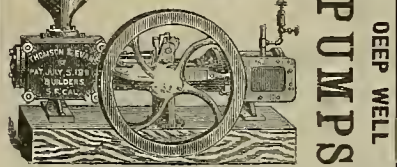
ANTIMONY.		STEEL.	
Per lb.....	@ 14 1/2	English, B.....	16 @ 20
Refined, in car lots @	14 1/2	Cantons.....	@ 9
Powdered, do.....	@ 8	5 1/2" Diam tool.....	@ 10
Concentrated, do.....	@ 7 1/2	Pick & Hammer.....	@ 10
All grades jobbing at advance.	Toe Calc.....	Machinery.....	@ 5
COPPER.		TIN PLATE.	
Bolt.....	@ 22	S. V. steel grade.....	@ 21 1/2
Sheathing.....	@ 22	1 1/2" x 20, spot.....	@ 7 00
Ingot, jobbing.....	@ 15	Overhead, 1 1/2" x 20.....	@ 7 00
Do, wholesale.....	@ 14	Do roofing, 1 1/2" x 20.....	@ 6 50
Fire Box Sheet.....	@ 22	Do roofing, 1 1/2" x 20.....	@ 6 50
IRON.		Pig iron, spot.....	@ 21 1/2
Bar, base.....	@ 3	Irregular, spot.....	@ 21 1/2
Norway, base.....	@ 4 1/2	COAL.	
Pig iron.....	Spot Load.....	SPOT FROM YARD—PER TON.	
Exhibition ton.....	@ 26	07 00 Wellington.....	@ 8 00
Glenbrook.....	@ 27	00 00 Greta.....	@ 8 00
Am. Soft, No. 1.....	@ 28	00 00 Carbon Hill.....	@ 8 00
Oregon Pig.....	@ 25	00 00 Nanaimo.....	@ 9 00
Puget Sound.....	@ 27	00 00 Gilman.....	@ 7 00
Clay Lane White.....	@ 23	00 00 Seattle.....	@ 7 00
Spotts, No. 1.....	@ 27	00 00 Coos Bay.....	@ 6 00
Langdon.....	@ 25	00 00 Channel.....	@ 9 50
Thorndiffe.....	@ 26	00 00 Eggs hard.....	@ 14 00
Gartsberrie.....	@ 26	00 00 Cumberland, in sacks.....	@ 14 00
Barrow.....	@ 25	00 00 Do, bulk.....	@ 13 00
Cargotte.....	@ 23	00 00 Wall end.....	@ 9 00
CHROME IRON ORE.		Scotch Splint.....	@ 8 00
Per ton.....	@ 10 00	Erymbio.....	@ 8 50
LEAD.		West Hartley.....	@ 8 00
Pig.....	@ 42	TO LOAD—PER TON.	
Bar.....	@ 51	Australian.....	@ 25 00
Sheet.....	@ 71	Liverpool Steam.....	@ 7 00
Pipe.....	@ 62	Scotch Splint.....	@ 7 00
(Discount 10% on 500 bags.)		Cardiff.....	@ 25 00
Drop, 3/4 bag.....	@ 1 90	Lehigh Lump.....	@ 14 00
Buck, 3/4 bag.....	@ 2 10	Cumberland.....	@ 10 00
Chilled, do.....	@ 2 30	Egg, hard.....	@ 12 00
QUICKSILVER.		West Hartley.....	@ 7 50
By the flask.....	@ 50	English, to load.....	@ 90 @ 11 00
Flasks, old.....	@ 40	Do, spot, in bulk.....	@ 12 00

ANNUAL MEETING.—THE REGULAR Annual Meeting of the Stockholders of the Inyo Marble Company will be held at the office of the Company, No. 137 Montgomery Street, San Francisco, California, on THURSDAY, the Tenth day of September, 1891, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books close on Monday, September 7th, at 2 o'clock P. M. G. W. LUOE, Secretary. Office, G. W. Luoe, Secretary, No. 132 California Street, San Francisco, California.

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SITUATION WANTED By a man 42 years old, with 7 years experience in gold, silver and opal mining and surveying; graduate of the Mining Academy in Schenauitz, Hungary. References in Hungarian (Magyar) language. Content with moderate salary until he proves his ability. Address FREELAND, P. A., Lock Box 52, G. S.

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NEW EL DORADO OLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, El Dorado County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of August, 1891, an assessment, No. 3, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of September, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 24 day of October, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. J. W. FEW, Secretary. Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

GRAY EAGLE MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of August, 1891, an assessment, No. 25, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of September, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 6th day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors. A. W. BARROWS, Secretary. Office, Room 11, No. 303 California Street, San Francisco, California.

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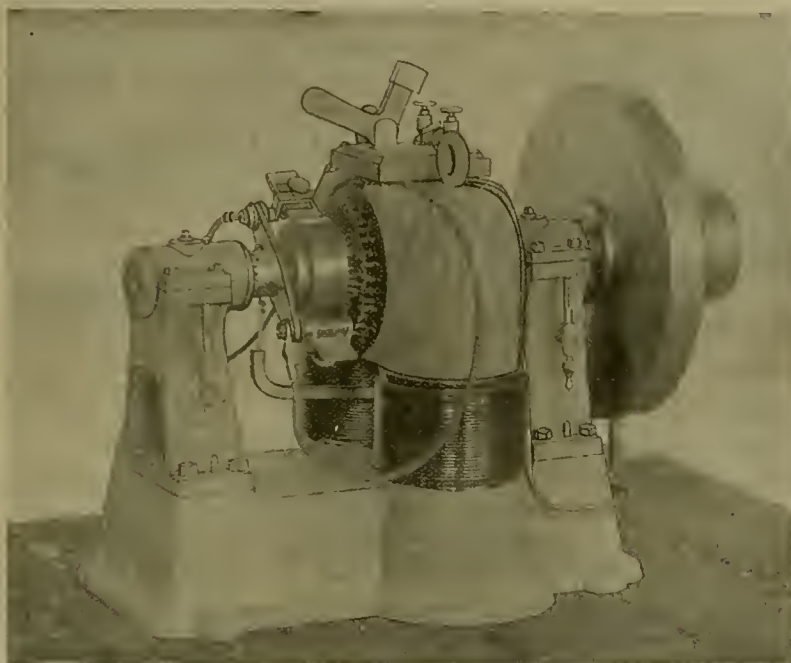
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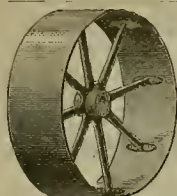
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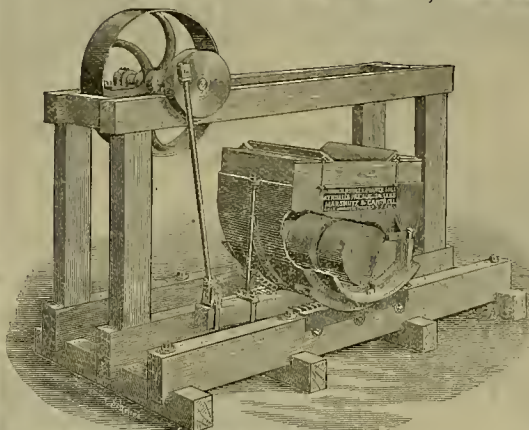
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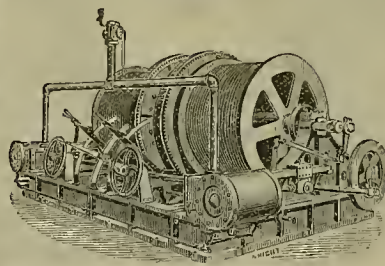
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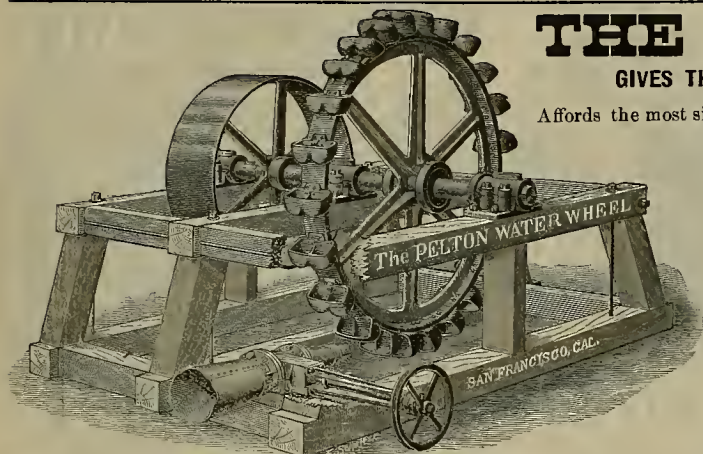
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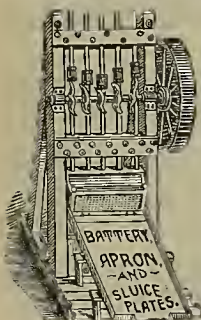
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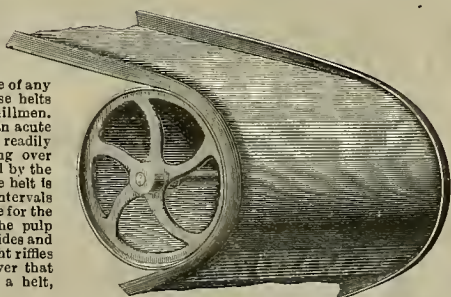


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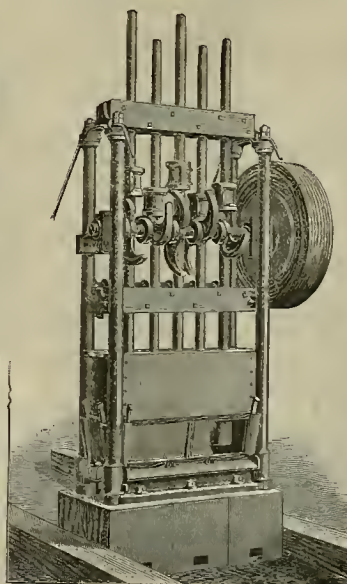
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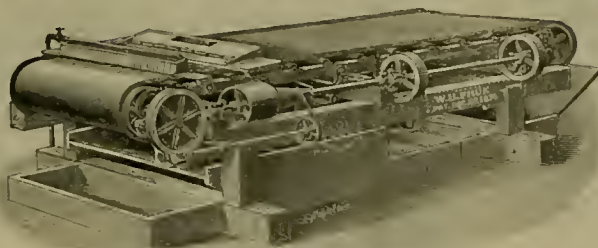
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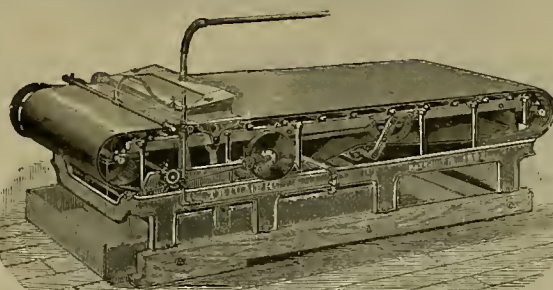
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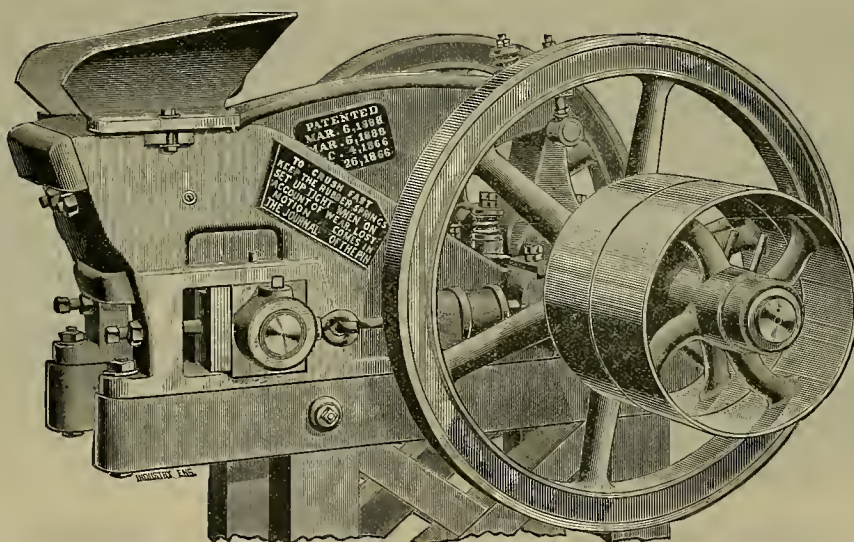
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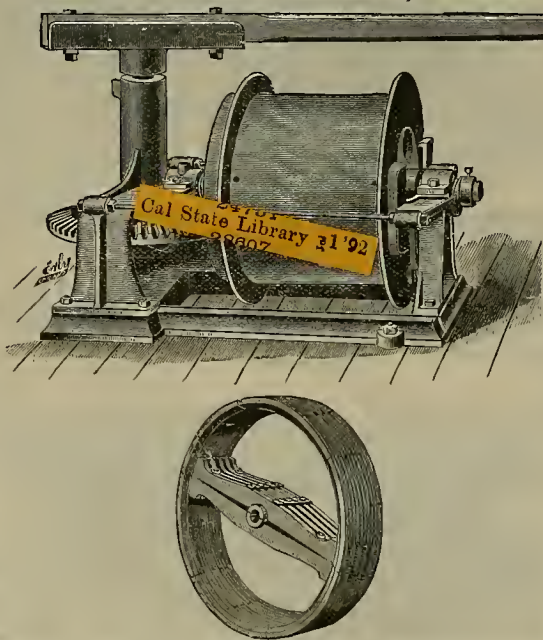
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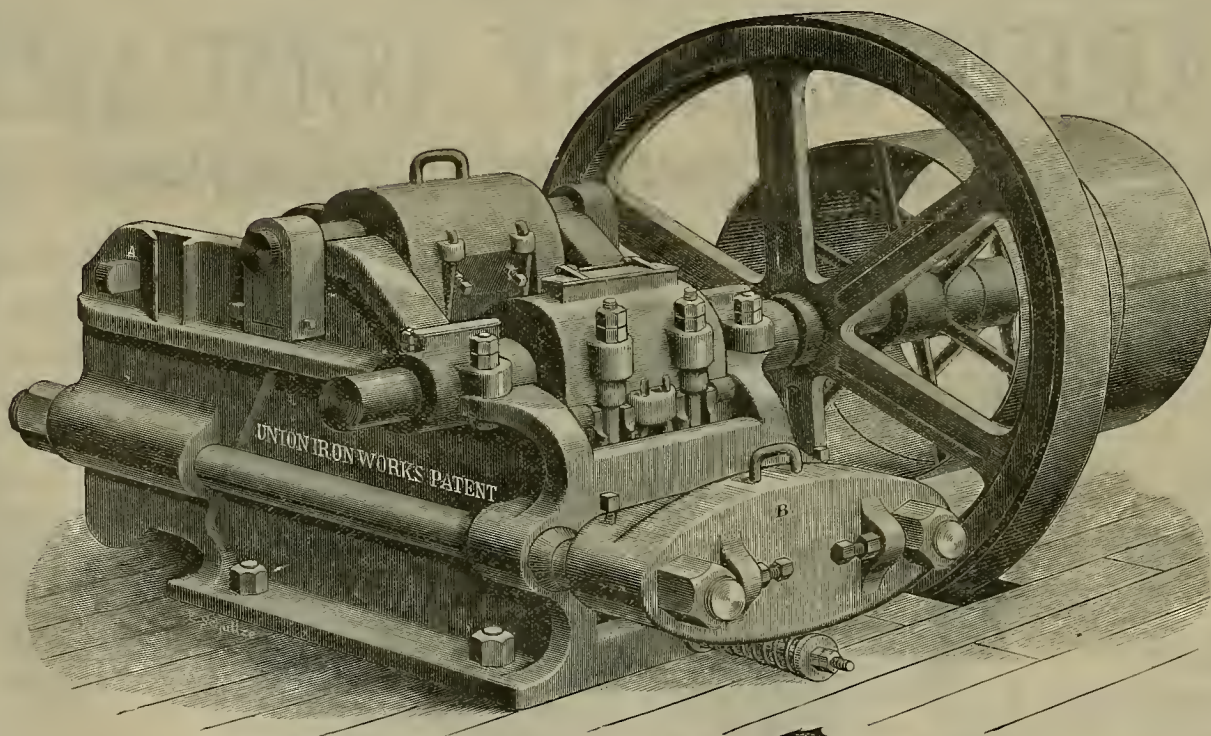
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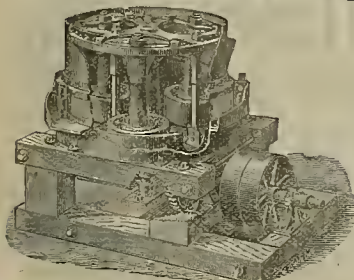
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SAN FRANCISCO, SATURDAY, AUGUST 29, 1891.

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Long Distance Electric Power Transmission.

The accompanying engraving represents the dynamo made by the Electrical Engineering Co., of San Francisco, for the Black Diamond coal mines near Seattle, Wash.

This dynamo has a capacity of absorbing 120 mechanical horse power, and giving off to an electric circuit more than 90 per cent of that in electrical energy. It is of the constant-current type, with variable electro-motive force, and the armature is wound under the Keith patent of Nov. 30th, 1886. It is perfectly self-governing in preserving a constant or uniform current, and in varying the electro-motive force to suit the requirements for power at the motor, or motors, on the circuit.

At the Black Diamond mine, it supplies electric energy to an 80-horse power electric hoist, located at the head of a slope, 3100 feet from the mouth of the mine. By this method, a train of cars carrying 12,000 pounds of coal can be hoisted up the slope, which is 450 feet long, with a grade of 1 to 3, in one minute. The stoppage movements of one lever controls the hoist in all its movements, and much more readily than is the case with a steam or compressed air hoist.

But three-horse power is lost in conveying the necessary power to the hoist. This waste is very much less than by any other known means. We will in the near future illustrate the hoist referred to.

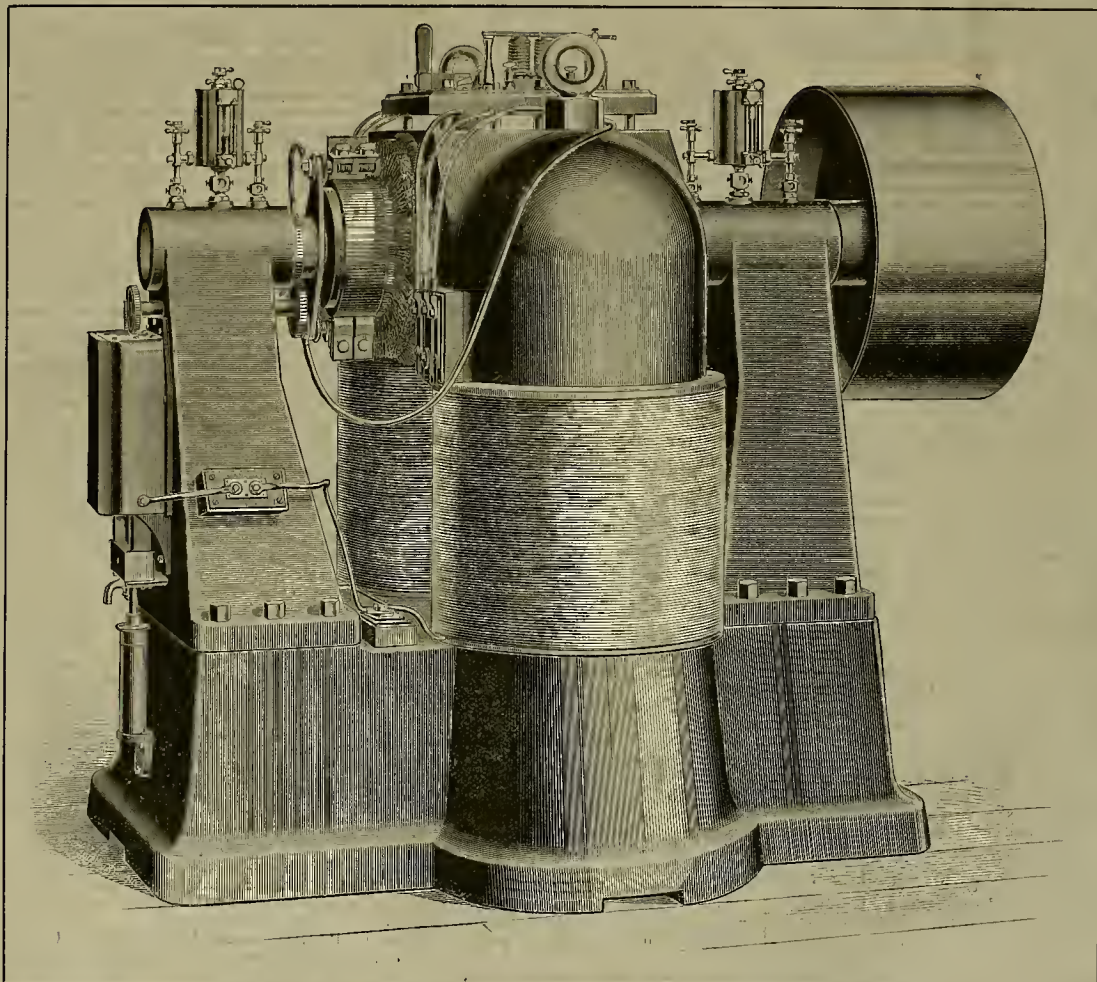
Children in Mines.

It is noteworthy that the investigations of the Census show that there are employed in the gold and silver mines of the United States only 82 boys under 16 years of age. No women or girls at all were found to be working in these mines. This is a very different state of affairs from what obtains in European countries, where many women and children work in the mines; and in the Eastern coal, copper and iron mines, boys are employed in light work. Abroad, legislative restriction has had a good effect, but it has not been necessary in the

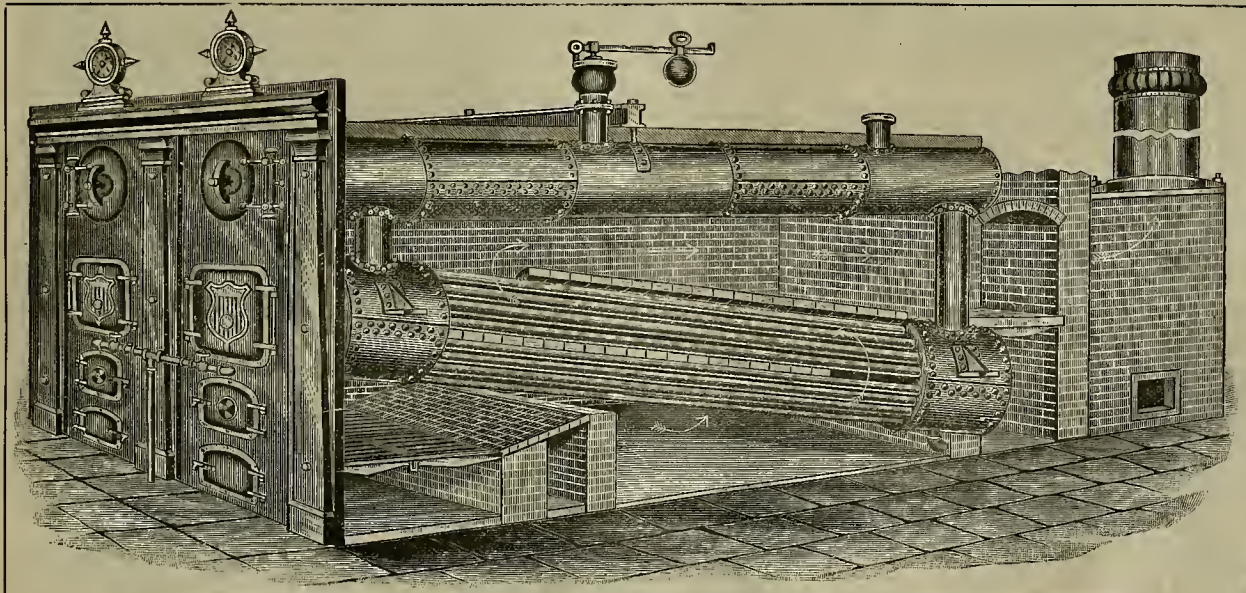
western part of this country. The "pit-brow lassies" of England and Wales number about 6000. They are the girls and women who are employed about the "brows" or months of British iron and coal mines. Female labor underground is prohibited, and there are restrictions also on juvenile labor. The gold and silver mines of the country have thus far been free from the necessity of employment of children, or of convicts and contract foreign importations. The Italians, Hungarians and Poles, who swarm in such numbers about certain mining regions in the East, seem to breed trouble wherever they are. They work very cheap and crowd out the native-born mining communities. Such Italians as are in our coast mines work for the same wages as others, and are individually independent, not coming on the contract system in vogue in the East.

THE Tarentine has beaten the Ma-jestic's wonderful record across the Atlantic by one hour and 37 minutes. She made the best 24-hour run on record, 517 knots, and also the best three days' run. She traveled at the rate of a sea-mile in 2.95 minutes, and at the rate of 20.104 knots an hour. The vessel made 1532 knots in three days, the fastest time ever made. This beats ordinary railroading.

JOHN DOUET was killed last Sunday at the Utica mine.



120-HORSE POWER DYNAMO FOR ELECTRIC POWER TRANSMISSION



WOOD'S WATER-TUBE SAFETY STEAM BOILER.—See page 137.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mines of El Dorado County.

(From Our Traveling Correspondent.)

EDITORS PRESS:—Leaving Plymouth, you can tell by the change in the roads when you cross the county line into El Dorado, as you can in passing over to Calaveras. If there is one thing more than another that Amador is celebrated for, it is her rough roads in summer and tough roads in winter. Below Nashville, the Los Padres shaft has been cleaned out and drifts are now being run east and west on the vein. The mill will be started up when sufficient ore has been accumulated. So far only the footwall side of the vein has been worked. No crosscut has been driven to the hanging wall, but it has every appearance of being 50 feet distant—judging from crosscuts on the croppings. The ore from the surface drift, to a depth of 50 feet, milled over \$14, after the richest of the ore had been selected and worked in an arrastra. The vein is evidently very large, and in depth the ore from the shoot should grow in value. The exact length of the shoot is not known, but good prospects can be got from the croppings for a distance of several hundred feet.

The McNulty has closed down.

The Ohnroh is keeping up its reputation, if not exceeding it, by very rich ore in the 700-foot level. If the proceeds of the ore from this mine could all be invested for one year, in developing it, the property could then produce dividends double those now turned out from the seven-foot vein of average \$18 ore. The Church is, without doubt, the best mine in the county to-day.

At Placerville,

The Rodgers, Cedar Ravine and Landecker drift gravel mines are all running regularly, and said to be doing well. The Gentle Annie is dropping her stamps with accustomed regularity and has just contracted for 200 feet more in depth by shaft. The Pacific is running its 20-stamp mill from ore out of the 1000-foot level, in the Pacific proper, to test the value of the vein, which is here 21 feet wide. The company is also sinking and drifting on the Epley and making an upraise. The vein is showing good ore. On the Harmon the company is taking out the water and getting ready to operate the mine.

The company is also driving a tunnel on the Van Hooker, which is now in 900 feet, with 100 feet to go to the vein 600 feet deep. With the general starting up of the Pacific Company's mines, the future looks brighter for Placerville.

Slate Quarries.

Down at Chili Bar, the Chili Bar slate mine is running along with its accustomed regularity and vainly trying to keep up with its orders. The California Slate Co. have about adjusted their difficulties and can resume at any time. Over at Kelsey, Mr. Strable is taking more interest in his own broken anatomy than he is in slate. The slip of a neck-yoke put him under a wagon-load of slate that broke several ribs and otherwise crippled him for the present. The slate, however, is going forward just the same. The "Chili Bar," "California" and "Strable quarries" are said to be all held under bond by parties who contemplate the purchase and consolidation of the three properties. On my last visit I called attention to the advantages here offered for the investment of capital in an established business yielding a large profit, but badly handicapped for want of working capital. These slate quarries are inexhaustible, the demand constant and ever-increasing, while the freight from the East leaves a good margin of profit in itself. I would repeat the opinion I stated before, viz.: "The slate mines of El Dorado will in time exceed in value all the quartz mines of the county."

At Kelsey,

The Dalmatia is running smoothly with its electric power, and the superintendent, Mr. J. Cullen Pierson, will soon convey the same power and operate their recent purchase—the St. Lawrence—by electricity under the Keith system, transmitting the power by wire for a distance of over five miles.

The Ida Livingston, which is situated near Kelsey, is now being developed. The shaft is down 100 feet, and drifts will be run to the top of the shoot, which is known to be of a good grade of ore. Mr. J. T. Kelley is in charge of the mine.

Over at Garden Valley the Taylor is running right along despite all the reports to the contrary. The 20-stamp mill is a good one, and will be kept busy on the 6 to 30 feet of vein matter. The shaft is now down 500 feet. The Ivanhoe, Lone Jack, Esperanza and Rosencranz are idle. Some of these mines would undoubtedly prove good properties if the vein was sought where it is, but there is a class of miners who will have a vein where they want it or not at all, and this section has had more than its share of that kind of mining with the mines closing down in consequence.

At Georgetown,

The Van is tied up in litigation and is idle in consequence. The quartz mines of the county have been more prosperous in the past, but it looks as though there was a brighter future.

One thing is certain—the county contains a vast amount of practically unexplored country and a large number of promising prospects that look worth developing. E. H. SCHAEFFLE.

Ophir, Placer County.

(From Our Traveling Correspondent.)

EDITORS PRESS:—Ophir is quiet at present. The Hathaway, Geo. Taylor superintendent, is sinking its shaft. It is now down 400 feet, the vein averaging 30 inches of \$8.50 ore. The beauty of this mine is in the fact that \$8.50 is the average of all the vein matter throughout the entire length of all the drifts. The mill will start up as soon as water can be secured, which will be before the end of August.

The Mina Rica.

J. W. McCullough is superintendent of this mine, which is located about 1½ miles southeast of Ophir. The vein is opened by shaft, which is down 150 feet, with drift of 387 feet, and by drift from surface 500 feet long. The pay is continuous; vein averages 22 inches, with values ranging from \$5 to \$200 a ton. The mine has now a ten-stamp mill in operation.

The Moore Mine.

This property is immediately below the Mina Rica. The shaft is now down 200 feet on the 11-inch vein. No drifts have been run, but from the vein, \$70 to \$80 ore has been extracted. Over \$30,000 have been extracted in the past two years. The mine is now equipped with a good hoist, and promises to be heard from in the near future.

At the Three Stars mine, Mr. Hanley is engaged in putting down a three-compartment shaft, and is now down 50 feet on a three-foot vein of very good ore. The Gold Blossom and Eclipse are idle. The mines of Ophir are mostly in granite. Some of the mines of this district have produced exceedingly rich ore. Those now working are on lower-grade ore, but it occurs in shoots of sufficient length to make the mines paying propositions.

E. H. SCHAEFFLE.

Feather River Gold.

The River Turned from Its Natural Bed.

"No one allowed on these works without a permit."

That is the kind of greeting I found on the gate that gives entrance to the great Golden Feather mine above Oroville, writes a correspondent of the Marysville Appeal. They enforce this, too. There are too many shining sands laid bare to allow indiscriminate visits from the prying populace. Then the partially smothered rumors of the discovery of rich snken ledges by workmen engaged in the preparatory work, no doubt, causes a desire on the part of the many curiously inclined to go and see for themselves.

The old-time miners took out a vast quantity of golden treasure in early days from a claim very near the Golden Feather, and now that a claim, probably richer than the Old Cape of '49, is about to be laid bare, an intense desire on the part of the public to go down into the dried-up river-bed and scoop up handfuls of golden flakes has caused the posting of that chilly greeting on the outer portals.

My credentials permitted me to inspect the immense rock and cement wall which separates the artificial bed, through which the river now runs, from the old bed, now fast drying up. Only a long series of pools of water, and hars of sand and gravel, are to be seen where once ran the floods of Feather river. These pools are to be pumped out and the entire dried bed, 10,000 feet in length, carefully and scientifically relieved of the vast treasure that has long been supposed to lie here guarded by the racing waters.

I found Major McLaughlin, the general manager and promoter of the company, at camp, one of the villages at Golden Feather. He was on a tour of inspection, having driven up from his Oroville office with his secretary, Mr. Giesse.

Major McLaughlin pronounces his work—the turning of the Feather river from its bed for a distance of more than two miles—"the most stupendous piece of mining engineering ever executed."

In reply to my inquiries, he said that they were a month ahead with their work, and that notwithstanding that everything had been done in the most substantial manner, the river has been turned a month earlier than ever before known in the history of river-mining. The work of rigging the pumps is now being proceeded with, and in a short time the active work of cleaning up the pay channels will be commenced.

The Major refused to talk about the probable amount of gold that he expected to obtain, but that the amount is enormous may be judged from the wonderful piece of work that he has just completed.

There are two separate and distinct English companies engaged in the work—the Golden Gate Company and the Golden Feather Company. One is capitalized at \$250,000 and the other at \$1,000,000, and the claims adjoin each other.—*Sacramento Record-Union*.

A FURNACE will soon be put up at the Chinuar King quicksilver mine, Sonoma county. Some very rich ore has lately been found.

Country Roads and City Streets.

NUMBER 2—CONCLUDED.

[An essay by MRS. MARY L. HOFFMAN, read at the meeting of the Women's Press Association in S. F., July 13, 1891, and furnished for publication in the Press.]

Poor Macadam.

We think it entirely safe to say that poorer excuses for roads than those, in this country, called by courtesy macadamized roads, could nowhere else be found. The hard-headed Scotchman who introduced the road into England would indeed be shocked by a view of this bungling counterfeit. We trust he is unable to see it.

To the credit of our present Board of Supervisors, he it said, they have now made meta and honde beyond which those "wicked ways" of mud and dust can never again come.

In Baden, one of the smaller States of Germany, we find the heat of macadamized roads. There they use a hard basaltic rock, for which they pay \$1.78 a cubic yard, and find it good economy. Their experience proves that the harder and tougher the rock the better the road, and the better the road the less tractive force required.

In the macadamized roads of Paris, it is the rule to roll the road with from 12 to 20-ton rollers until a piece of the hardest rock procurable is crushed without being pressed into the surface of the road. Such macadamized roads as are found in Baden and in Paris a majority of the people in this country have never yet seen. Welcome the day when in our outlying districts we shall see, if macadamized roads we see at all, just such roads as Baden and Paris have shown to be not only possible, but of macadamized roads the most economical.

We must bear in mind, however, that even the best macadamized road has these defects—more of less mud in winter and dust in summer, great resistance to traffic and great cost of maintenance, requiring, during summer and fall, according to the best authorities and close observers, to be watered three or four times a day.

Objections to Stone Block Pavements.

Of stone block pavement, with the noise and continual din incident to travel upon it—concerning its effects upon delicate women, upon children and upon invalids—what shall we say?

To the women, nervous diseases, to the children of ten years hysterics, and to invalids, certain death. These are some of the concomitants of a block stone pavement, with its incessant clatter.

Gen. Q. A. Gilmore, C. E., a noted authority upon the subject, says:

The joints of a block stone pavement constitute, after enlargement by wear, fully one third of its area, and under average care, the surface of fifth exposed to evaporation, covers fully three-fourths of the entire street. This foul organic matter, composed largely of the urine and excrement of animals, is retained in the joints, runs and gutters, where it undergoes putrefaction in warm, damp weather, and becomes a prolific source of disease. During a moderate rainfall it is as foul as any sewage.

During dry weather the street soil, of which a large proportion is horse manure, becomes dust and floats about, injuring the eyes and poisoning the respiratory organs.

We employ servants and we instruct them to be vigilant to detect, and persevering with brush, broom and chamole, to eradicate the very dust we have invited.

Prof. Ely of the Johns Hopkins University advises that we use our energy to enlighten the public authorities and to co-operate with them and that we set about "stimulating the municipal conscience."

Work of the Wheelmen.

If it be true that one extreme follows another, then surely are we about to enter upon a grand era of road-building and of street improvement. As valuable coadjutors, 15,000 wheelmen have suddenly appeared, and books little and big upon the subject have they scattered broadcast over the land. Some of these books it has been our pleasure to read, and to Geo. P. Wetmore, Esq., one of the officers of the Bay City Wheelmen, we desire here to return thanks for a very interesting work, issued by the Kansas Wheelmen.

To a croaker who has said, "Oh, these wheelmen are all young," I would reply: "This defect, if defect it be, they are rapidly overcoming, and soon with added years and added numbers, with increased their efforts will be crowned."

That the civilization of a country is determined by the condition of its roads, we partly believe, but we also believe that from a long slumber upon the subject of thoroughfare, the people of this country are as one man awakening. And if sleep with us has proved "a generous thief," restoring to vigor what she has taken from time, we may well look now upon every hand for vigorous work.

Efforts of the Press.

The RURAL PRESS, awake to every public improvement, realizes the importance of this movement for good thoroughfare and "in season and out of season, advises permanent roads, impervious, and clean."

The Morning Call, systematically opposes all dishonest street work.

The Daily Examiner has well suggested that the substantial and honest improvement of our highways be made a political factor.

The Daily Chronicle in an exhaustive article

has directed attention to our need of legislation upon the subject of truck-building and of the weight each truck should by law, be allowed to carry. Leading civil engineers agree that one ton to each wheel, or four tons to a four-wheeled truck is a sufficient weight. If a law limiting the weight carried, and prescribing the width of tire should obtain,—a set of spring trucks like those in New York city would soon replace the savage trucks now in use on this coast, and the best of streets comparatively noiseless, would be possible—streets that even in the business quarter, people could "see and live."

The Daily Report has sought in many ways to improve our thoroughfares. In regard to the newspapers mentioned, we speak of our own knowledge. It is quite likely that other newspapers are doing equally good work; and so, in demanding permanent and cleanly roads and streets the press is united and our work is auspiciously begun.

Washington, D. C., has long since answered the question "What pavement shall we have for our residence districts and of bituminous pavement she has over a million yards, clean and noiseless.

The example set by the city of Washington, Buffalo was the first to follow, and now 34 cities of the United States have a total area of five million square yards of bituminized pavement—more than twice as much as all Europe combined.

Smother than stone, more durable than macadam, and more cleanly than either, we have, to-day nothing that excels it.

During the past year Cincinnati has spent millions of dollars in bituminous pavements, and property on Race St. so paved in that city has advanced 33½ per cent; and the same is true of property on every well paved street in every city.

Philadelphia and Baltimore still have cobble-stone pavements; and when we contemplate the incessant din in which most of a business man's day is spent, small wonder is it to us that he suffers intensely from nervous diseases, especially in those cities where many ringing pavements obtain.

Cost and How Provided.

In St. Joseph, Missouri, the cost of a bituminized pavement is \$2.63 a square yard. In Topeka, Kansas, \$3, including the grading of 9 inches of the street. In Omaha \$2.98 with a money guarantee to keep it in order five years.

The Morning Telegraph of New London, Conn., has made a tabulated summary of pavement data from about 30 American cities from answers given to questions sent out by the paper.

In eight cities the whole cost is borne by the abutting property. In three cities, viz., New Haven, Conn., Oswego, New York, and Utica, New York, the cost is divided between the abutting property and the city at large.

In 21 of these cities heard from, the cost of paving is paid from the general tax.

From none of the Massachusetts cities sending replies, is there any assessment on abutting property.

In the six Connecticut cities, five put the whole cost upon the city at large, while one puts the cost upon both city and abutters.

We would suggest a federation or Congress composed of delegates from each city, to discuss the vexed question, "How shall street expenses be met?"

Bituminous Rock Pavements.

Mr. Stevens, Secretary of the San Francisco Free Library, a cultured and traveled man, has said: "You know the streets of Washington are not paved with the same bituminous rock we use in San Francisco. Ours is much better than theirs." This he said with an earnestness born of conviction, and he had many times passed over the pavements of both cities.

The wear of bitumen has been found to be quite small, diminished thickness under traffic being principally due to compression and not to abrasion.

It has been ascertained in London that some streets paved with bitumen, and subject to four years' wear of the heaviest traffic, the bitumen had diminished one-ninth in thickness, while in specific gravity it had increased in about the same ratio.

Some of the same street dressing, after 15 years' wear in the Rue de Bayere, Paris, was found to have lost 12 per cent of its thickness, but only 5 per cent of its total weight. The average life of bituminous pavement, as laid in Washington and Paris, is 17 years.

Less sonorous than granite or basalt, bitumen as a pavement dressing is comparatively noiseless, and when properly laid upon a good concrete foundation of sufficient thickness, heavily loaded vehicles, unless the day be very warm, make no impression. It is related as a fact (and as far as we are aware the statement has been discredited by no one) that over a piece of bituminous pavement at the corner of Fifth avenue and 24th street, New York, a heavily loaded four-wheeled truck weighing 3 tons, carrying a boiler weighing 21 tons, passed without leaving a mark.

Unless stone blocks be of excellent quality, bituminous rock takes the first place as to durability and stone-block pavement the second.

General Gilmore thus conclusively sums up the advantages of bituminized streets:

1st. They produce no dust and therefore no mud.

2d. They are comparatively noiseless.

3d. They do not absorb and retain noxious liquids, but facilitate their prompt discharge into side gutters and sewers.

4th. They are impermeable and emit no noxious vapors themselves nor allow their emission from the subsoil.

5th. They reduce the force of traction and consequently the expense of wear and tear of animals and vehicles.

6th. Although they do not furnish so strong a foothold for animals with a heavy load as stone blocks in narrow courses, still they do not become polished and slippery from continual use.

For pleasure driving, for cycling and for all street purposes, its cleanliness, its noiselessness and its imperviousness to deleterious odors, commend the bituminized street.

Its velvety texture, and the mellow tone of its color, make it pleasing to the eye, and we trust it may be "a joy forever."

The City of Washington, our national capitol, has the best paved streets in the world and the widest. She has 25 avenues and 22 streets, each over 100 feet in width, and 11 of her avenues are 160 feet in width. It would be well for each of us to inquire how many streets and avenues in his or her own city measure 100 feet in width; how many 130 feet; and how many 160 feet. The answer would doubtless surprise the residents of more than one city.

That the mortality from phthisis and other diseases be lower in wide than in narrow streets, medical authorities agree; and so the desirability of wide streets is not a debatable subject.

Commonwealth avenue, Boston, said to be the handsomest residence street in the world, is 400 feet in width, and between the drives, lawn and shrub and tree and statue are making of the passer-by and of the on-looker people of outline.

Oh, for a Shepherd! even though he were as levin as "Boss Shepherd" of Washington. A quarter of a century of utility and beauty have followed his croak in that well-paved city.

Boards of Public Works, removed from political influence, National and State legislation, with municipal co-operation, and the moral support of a majority of the citizens upheld and buttressed by a proper pride, would soon stamp with merited repute any household willing to subject his or her family to the health-destroying, comfort-subverting annoyances incident to any but a noiseless, impervious pavement.

In the city of Buffalo, we find 100 miles of bituminized streets, and the authorities tell us that only about \$100 has it cost in the last six years to keep these bituminized pavements in repair.

In San Francisco, one-seventh of all "accepted streets" are bituminized. Over them to ride is a treat, and upon them to reel is a joy.

In view of this, shall we still construct a miserable street that is a poor imitation of a real macadamized road? Heaven forbid.

Oakland Streets.

In the city of Oakland, upon grove and other streets, we find beneath the gutter upon each side of the street a sewer, laid close to the curb and parallel to it, so that by side sewers and service pipes the street will never be disturbed.

As Oakland has, in this respect, improved upon San Francisco, so let us improve upon Oakland; and let us, under Market street at least, have a sub-way as London and Paris have under their streets. If necessary, issue bonds for its construction. Through this tunnel, let sewer-pipes, gas-pipes, water-pipes and all pass, and let each pay its quota. When at an early day the Market street sub-way shall have demonstrated itself as a first-class business proposition, Montgomery street, Kearny street, Van Ness avenue and Point Lobos avenue will clamor for early consideration in the same line, and the vision of our city in all her youthful vigor a leader, with older and less progressive cities following, will have materialized.

Oakland has bituminized Telegraph avenue to half its width from Broadway to 33d street, a distance of over three miles, and opened it to travel while she paves the other half.

Oakland allows no wooden sidewalks to be built anywhere within the city limits; and the glare of all artificial stone walks must be toned down by a specified amount of color. Here then are examples from Oakland worthy of imitation.

But while Oakland with a tax of \$2.05 upon \$100, lays down hitmen upon a foundation of macadam, reminding us of a man who should build his house upon a lot of three-legged stools placed side by side, we must in passing, administer to her a little friendly criticism.

Concrete Roadways.

Good concrete, once laid, lasts practically forever, and over it any style of hitmen or other top dressing can be laid; as over a dining table we lay a piece of cotton flannel to deaden sound.

In British India where are to be seen some of the best roads in the world, we find many concrete roads pure and simple. But, of course, the concrete for a road must be made of a hard tough rock, preferably basaltic and in correct and exact proportions, it must be mingled with best cement and best sand. For the basaltic rock with which the concrete for the roads in Bridgeport, Conn., is made, they pay \$1.50 a ton of 22 cu. feet or \$1.84 a cu. yard. The resulting roads are found to be useful, beautiful and economical.

If in spite of protests made by the nerves of men, women and children, whose lives are spent amidst its din, stone pavement be still demanded in a business street, let it be such a stone pavement as we find in Providence, Rhode Island upon Westminster and other streets,

That is a block pavement, laid on a hydraulic cement concrete foundation, six inches in depth.

The blocks which are uniform in size and regularly shaped, are set in exactly parallel rows across the street and hedged in the concrete. The spaces between the stones are also filled with concrete made of the finest cement and sand, and the hardest, toughest rock. In such a pavement, clean and smooth, it would be possible that many a citizen would take a personal pride.

It must be borne in mind that this pavement was laid in Providence by a Board of Public Works not under political control, and under the immediate supervision of a competent civil engineer.

Col. Albert Pope of Boston, who has, himself, come to be an expert upon road and street improvement agrees, not alone with civil engineers, but also with medical authorities that—

"A properly built highway must be built with a solid, firm foundation effectually separating the surface from the soil below."

"When public opinion becomes more enlightened, and property and vehicle owners gain a due appreciation of the great economy of horse flesh and vehicles by the use of bituminized pavements instead of rough and rigid stone."

Our city will rival Washington in her charming drives, and our genuine macadamized roads, properly constructed of the hardest basaltic rock, will be relegated to the country districts, and riding, driving and cycling will be restful.

The highest authorities and the closest observers tell us that a macadamized road must be made of a basaltic rock, not of red rock nor of a flint-like rock.

Major R. Malcolm, C. E., late of Bombay, where we see the most perfect system of road-making in the world, says in regard to the durability and economy of the concrete roads, as compared with macadam, that "If we estimate the cost of building and maintaining each for a term of ten years, the actual cost of the concrete road for the term of ten (10) years is 50 per cent less than that of the macadamized road for the same time. He refers also to the comparative ease with which loads are hauled over the concrete road. Upon a properly built concrete road, the same animal can draw more than twice as heavy a load, and as its average cost is half as much, it would be at least four times as advantageous, in addition to being ten times as clean as a macadamized road.

Good Roads Are an Investment.

And not a tax. By the increase in property values, they are paid for many times over.

In Philadelphia, a committee of citizens alive to the importance of this subject, in 1889 offered through the University of Pennsylvania cash prizes of \$400, \$300 and \$100 for the best essays upon road-making and maintenance and road laws. The first prize was won by Henry Irwin, B. A., C. E., Canadian Pacific railway, and in his paper he gives a capital rule by which all desiring to make the best of solid concrete may make it.

Recipe for Concrete.

As such proportions appear to be a dead secret to so many "concrete" makers in this and other cities, we cheerfully give them here-with:

Into every box of sand, pour enough cement of best quality to fill the voids left by the sand. To this add ten per cent more cement. Into the same box, filled with broken rock pour sand enough to fill the voids of the rock, and to this add ten per cent besides.

If this rule be followed, he says, strong, compact concrete will result. But if less cement or less sand be used, the result cannot be depended upon.

That education in road-making is much needed in this country admits of no question. In a paper read recently by Mr. George E. Crane before the Minneapolis Society of Civil Engineers on "Permanent Improvements in Highways," he says that \$300,000 is practically thrown away by the method of road-making now in vogue in the State of Minnesota.

With good streets, a demand comes for light, elegant and graceful vehicles, and thus our aesthetic ride is cultivated.

The Mayor of Philadelphia, by a wise selection of General Wagner as Director of Public Works, has given the taxpayers greatly improved streets and at the same time saved them \$1,000,000 a year.

When we remember that New York, through all her bossism and Tweedism, has come to be at least as well governed a city as Boston, we are reminded of a glimpse given us in the Apocalypse of a radiant throng, introduced as they who had come "through great tribulation," and for our city, standing as she does in some respects upon a higher plane with each governing body, we see a radiant future.

Road Regulations.

To our present Board of Supervisors and to our Mayor, of whom we are justly proud, we would here refer. That they are conducting the business of this city upon business principles, as far as dollar-limit pledges and political shackles will allow, we believe; but we elect officials to guard our interests and to legislate for us, and when by the greatest diligence they could have become only half acquainted with the necessities of the situation, we proceed to elect to fill their places other men, who, upon the subject, have no knowledge at all. Besides, with pledges we bind them hand and foot and hid them make bricks without straw.

God-speed every municipal and State and national officer in all honest efforts toward

making our thoroughfares clean, durable and beautiful—such as shell he fitted not for the highway of kings, but for the upward march of a sovereign people.

While we dilate upon the effects of first-class roads and streets, upon property values and business generally, we should remember that upon the best of streets depend the health and comfort of all our people. Each has, at longest, "so little while to stay," that all our highways and byways should at once be put in complete order for his especial benefit.

That good roads must be smooth upon the surface, practically unyielding and impervious to water, all are now agreed, and also that poor roads and poor pavements mean wasted money.

In New York a law is in force requiring all two-horse farm wagons, and all others that carry over one ton, to have tires four inches in width and to have the hind wheels eight inches farther apart than the forward ones, and that all carriages shall have their hind wheels the width of their tires farther apart than their forward ones.

With this law in force, it is claimed that the cost of road-making is reduced 50 per cent. Wagons thus made do not track; they make no ruts and they are more easily drawn.

In Paris the authorities do not allow wheel-harrow loads of concrete to be emptied directly upon the soil, but they do require the concrete foundation, as elsewhere, six inches in thickness, to extend under the curb and four inches behind its rear face.

The city of Toronto having spent \$10,000,000 acquiring experience in the building of macadamized roads, unqualifiedly condemns them and hemoans the fact that to get rid of these roads and to possess her self once more of a dirt road, easily managed, will cost her many thousand dollars more.

Cincinnati reports that the chief thing permanent about the macadamized streets and roads of that city has been the permanent expenditure for repairs.

In view of such experiences, the Common Council of Topeka, Kansas, has preferred the dirt road to the so-called macadam road.

The first-class railway accommodations demanded in America and the extremely low-class "driving roads" would appear to be a misfit.

Every country road should be an Alameda—a shaded walk—for animals and men. With our country roads smooth and clean, and bordered with trees, it would be the ambition of householders and others to own beautiful horses and light, graceful vehicles, and of every wheelman near to glide past all on his high-grade cushion tired wheel, and riding, driving and cycling would be restful.

A number of enlightened and progressive men and women are urging that the science of road-making have its place in the course of applied mathematics in the different universities of this country. "Road and Street Improvement" is a subject in which every man, woman and child have either directly or incidentally an abiding interest, and North, South, East and West it is now attracting attention. Our commercial and agricultural interests require the best of shaded roads.

California, for her fruit interests alone, could well afford to build and maintain such roads, that her fruit which now reaches the market towns bruised and dust-covered might arrive in appetizing condition. The city people then would get, at least a part of the time, good fruit, and the fruit-raisers would get good prices.

A few bright leaders are already in the work we so enthusiastically urge. May their following be so ready and so earnest as to insure great progress in this work before the close of 1891. "Now is the accepted time."

If we have succeeded this evening in inducing so much as one person to work intelligently and successfully for the improvement of thoroughfares in his or her city or county or district, our reward will have been ample.

HITE'S COVE.—The Marlboro Gazette says:

Hite's Cove, only a few years ago, one of the most prosperous mining camps in this portion of the State, has fallen into a state of innocuous desuetude pitiful to think about. Where formerly hundreds of busy, active men, and many merry families held sway, and the thud of a hundred stamps made ringing music as they crushed out the glittering gold, now, one solitary figure is seen stalking about in solemn silence among the deserted houses and crumbling mills. Yes, for all the vigorous life which eight or ten years ago animated Hite's Cove, no one is left to tell the tale of former greatness, but Fred Gardner. He is at once king and people, and with no one to contradict or molest, he should be happy, but, no doubt, he would be so glad to see a human face, that he would enjoy even a lively quarrel with a knock-down.

REPORTS reached Tucson, Ariz., recently that the Mexicans have discovered a nest of nuggets in the low hills between the lower dam on the Hassayampa and Weaver rivers. They were from the size of shot up to \$20, and aggregated \$483.

SULPHATE of copper is in more demand in England, and sales for immediate delivery have been lately made at £15 7s 6d per ton. For delivery next year, £17 is asked by makers.

ANTIMONY is selling at £44 to £45 per ton in Liverpool.

THE Eureka Consolidated mine has \$50,000 worth of lead ready for shipment.

Nothing is ever done beautifully which is done in rivalry, nor nobly, which is done in pride.—Ruskin.

THERE are only four quartz mines being worked to any extent in Alaska, but these are all paying very well.

FLATS.—The present system of building in flats, which has become so popular of late, was practiced in ancient Tyre.

W. L. LONG, of Portland, Or., is the latest discoverer of the famous "Lost Cabin" mine on the Klamath reservation.

LEADVILLE, COLO., has a new thick vein of high-grade silver ore, found by boring with diamond drills at the Bohn shaft.

A NEW HAMPSHIRE housewife has found a new way to shell beans and peas. She runs them through the family clothes wringer.

THE AMERICAN ASSOCIATION for the Advancement of Science commenced its 40th annual session at Washington, D. C., on Monday, the 17th instant.

THE six leading Lake copper mines produced 22,438 tons of fine copper in the first six months of this year, as against 21,400 tons of copper in the same period in 1890.

RICHER ore than has been found since honanza days, has been struck in the Poorman mine, Silver City, Idaho. Those old mines do not appear to have been worked out after all.

ALUMINUM FOR ACTINIC LIGHT.—Herr Pulz informs the Vienna Photographic Society that he uses aluminum as a substitute for magnesium to produce an intense actinic light such as photographers require.

A MIXTURE of sweet oil and enough kerosene to scent it, lightly brushed into a horse's coat, will repel flies and small vermin and keep the coat bright and smooth and clean. Use a rather stiff brush and add a little elbow-grease.

AMOS HOWARD FISKE of South Framingham has been appointed Chief Engineer of the Leland Stanford Jr. University. Mr. Fiske is an engineer of large experience and especially well acquainted with the various systems of electric lighting.

ELECTRIC ELEVATORS, operated by electric motors are growing in public favor for use in private. They are designed to carry three passengers, and the apparatus by which they are operated is described as being very simple and compact.

ALASKA COAL.—A party of miners, with supplies, left on the steamer Jennie last week, for the coal claims of the Alaska Coal Co., Kachekmak hay, Cook's Inlet, Alaska. The coal is said to be of excellent quality. The men are going to thoroughly open up the new mines.

A CABLE TO BRAZIL.—Robert G. Ingersoll is reported as having said that he recently had a conference with President Harrison in regard to the proposed establishment of a cable between the United States and Brazil, for the promotion of which Colonel Ingersoll is acting as attorney.

THE De Lamar mine, Idaho, is working ore which assays \$33.98 per ton, of which \$17.55 is in gold and \$16.43 in silver. They have 86.10 per cent of the gold and 85.94 per cent of the silver. In June the mill turned out \$17,294 gold and \$19,042,27 silver. The gold is signed at \$20 per ounce and the silver at \$1 per ounce. The profits on the mine for June were \$27,036.

FORGING BY ROLLING is a method coming rapidly into use. In one of the rolling-machine manufacturing in Fitchburg, Mass., there is a process in successful operation for forging articles by rolling, the rolling work being done between flat bars working vertically, and having the form out into or raised upon the face. According to a published description of this establishment and of the method in question, an extensive business is done in making track bolts by this means, the head and threads being rolled hot, and, in especial, the process of rolling threads has been worked out to a great nicety, the product being as clean and accurate, and, it is alleged, the thread is much stronger than if it were cut.

THE MARBLE QUARRY.—The contract for the delivery of 250 tons of marble for the Stanford University has been completed. Besides this, about 100 tons have been forwarded to the company's yards in San Francisco. Another contract for 300 tons is in process of negotiation, with every probability of the company securing it. At the quarry, shipments have been at a standstill since the collapse of the derrick. Mr. Gillette, president of the company, came up Monday evening. He says the derrick can be made to do, with a thorough repairing, as the blocks will not be unusually large. W. H. Prouty has been awarded the contract for hauling all the marble shipped to the lone depot at \$5.50 per ton.—Amador Ledger.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BAY STATE.—*Ledger*, Aug. 22: The sinking operations have reached 80 feet, which is the depth of the old shaft sunk many years ago. It is intended to go several hundred feet—perhaps 500—before prospecting the ledge is inaugurated. The water, which nearer the surface was very troublesome, is now under easy control, and sinking will progress rapidly. The company paid out over \$1200 last month. All the employees are stockholders in the company, and have unshaken confidence in the outcome.

THE CLINTON CON.—Messrs. D. Guttman, C. Wieland and S. M. Shortridge, the attorney, came up from San Francisco on Sunday evening, concerning the suit instituted by George Newman against the Clinton Consolidated for \$517.99. They brought up sufficient money to pay the wages of the men for the last month, and also to satisfy the claim of Geo. Newman. For the latter purpose, the money has been placed on deposit in Ginnocchio Bros.' store. An application was made to the court to have the attachment released on both real and personal property on giving bonds in an amount to be fixed by the court; and the court on Tuesday granted an order lifting the attachment on furnishing a bond of \$8000. E. and A. Ginnocchio are the sureties on the bond. From this action it would seem that the company intend to contest the claim of Newman, or at least delay the payment of the debt. It is claimed that no demand was made for payment, and that the full bill was not received until after the suit was commenced. The mine and mill are running as usual.

MISCELLANEOUS.—Eight men were started to work this week grading for a mill at the New York mine, in John Bull gulch, about three miles southwest of Jackson. This property has been operated for many years on a small scale by W. G. Anderson and co-owners. They have now got some S. F. capitalists interested, and the work of putting up a mill, preparatory to the active prosecution of mining, will be pushed ahead.

AT PLYMOUTH.—*Cor. Amador Ledger*, August 22: The Good Hope mine is running a full complement of men, and making some very flattering developments in what appears to be a large body of ore. The Reeves mine is sinking the shaft. This mine has always been a success in a small way of working, but we notice of late the owners have increased their force of men from half a dozen to about 20, and are putting on more as fast as they are needed. The Plymouth Con. and New London are working as usual.

Calaveras.

UNION MINE.—*Prospect*, Aug. 22: Mr. Gilbert, the efficient and energetic superintendent of the Union mine is pushing things there now. A large quantity of rock is on the dump, and in a few days the mill will be started up. There is rock enough out now of good quality to keep the mill running for some time, and the mine is in shape to furnish all the rock the mill can crush.

SALE OF MINING PROPERTY.—Chas. G. Wheelock and Wm. A. McNaughton, who have been prospecting mining property in this vicinity went below Saturday. We learn that Mr. Wheelock has purchased the Swank mine on Willow creek, and a half interest in the new discovery of Byron Swank near by. A ten-stamp mill will at once be erected, and the work of crushing rock commenced. The Swank mine is sufficiently opened to admit the extraction of ore at once.

MINE BONDED.—The old Cap Thorpe mine, generally so-called, situated near Fourth Crossing, has lately been bonded we understand, to Hayward & Hobart, and work will soon be begun in it again. This has been a good mine, and we believe that it will prove to be still good.

BALD HILL MINE.—The parties, Messrs. Porter & Robertson who have bonded the Fred Brunner, or Bald Hill mine at Angels, evidently mean business, as they have commenced the erection of hoisting works, and are preparing to work the mine on an extensive scale.

THE ORCHARD MINE.—The Fisher Brothers have been bauling timbers and lagging, from the Fisher ranch to the Orchard mine in town this week. We hear the mine is looking fine the past few days, and some excellent prospects taken out.

AROUND MURPHYS.—*Calaveras Prospect*: The project of running a tunnel through the hill between this place and Douglas by McCormick, Bisbee & Thomas will ere long be put under way and it is expected that by a year the work will be put through to the main diggings. A flume will then be constructed through the tunnel having an outlet on the Douglas side and the rich deposits will then be worked upon a plan of economy and science. There is a theory extant that in running this tunnel the owners will strike a rich vein of quartz as howlers of great richness have been found in many localities on this hill.

HORSWILL MINE.—*Chronicle*, August 22: Work is being pushed right ahead in the Horswill mine near the Flume House. The incline is now down over 480 feet. It is calculated that 150 feet more will have to be run before the bedrock will be reached.

El Dorado.

NEW MILL.—*Georgetown Gazette*, Aug. 22: Work of putting up the mill on the St. Lawrence mine began to-day, under the supervision of G. H. Roelke of Spanish Flat, the well-known carpenter and millwright. Judge Harmon of Oakland is up this week inspecting and directing operations of his Darling mine. The shaft has reached a depth of more than 80 feet.

Nevada.

THE ROACH PROPERTY.—*Grass Valley Telegraph*, Aug. 22: The Hartley M. Co. have purchased the Roach mining ground, or what is known as the Wingfield Scott ledge. To-day the directors met at the Citizens Bank and paid the first installment on the purchase. The ledge is a continuation of the Lone Jack, Homeward Bound, Omaha and others—they are all the same ledge called by different names. About \$5000 worth of development work has been done on the property and about \$600 worth of gold has been taken from the quartz,

The company will immediately put up hoisting and pumping machinery and when that is completed a new incline will be sunk. The company have great faith in their new venture and will spare no pains in thoroughly developing it.

STRIKE IN THE DELHI.—We are informed that a very rich strike has been made in the Delhi mine within the past two or three days. The mine is near Moore's Flat and Robert McMurray is the principal owner. There has been a great deal of money taken out of the Delhi mine and the strikes have been numerous, but the one made the other day is said to far excel any of the rest in richness, as there seems to be more gold in the quartz.

CALIFORNIA MINE.—*Grass Valley Tidings*, Aug. 21: A cleanup from 14 loads of ore from the California mine was completed Friday evening, the yield approximating that of the first crushing. Work on the new hoisting works is under way, and when completed a five-stamp mill will be constructed. At a meeting of the directors held Friday evening, P. H. Paynter resigned as a member of the board, and is succeeded by Mr. Payne of Sacramento of the firm of Booth & Co.

STRIKE AT THE NORTH BANNER.—North Banner mine stockholders are feeling much elated, for aside from the fine bodies of ore in the drifts, the ledge has again been cut in the shaft. The vein is large and the ore evidently of as good quality as that in the drifts and stopes above.

A BIG NUGGET.—*Transcript*, Aug. 21: Jerry S. Goodwin, who is operating the Uncle Sam drift mine near You Bet, yesterday panned out a \$656 nugget of gold while prospecting some dirt in the face of the drift. The chunk is the largest unearthed in that part of the county. It is shaped much like an early rose potato, and is about 1½ inches thick and three inches long. A little quartz adheres to one side of it, and the gold is comparatively smooth, as though it had been washed some distance. Last year, in a canyon in the same vicinity, Mr. Goodwin found a small howler that contained \$177 worth of gold running through it in one streak.

Plumas.

AT LA PORTE.—*Plumas National*, Aug. 22: While at La Porte last week we were shown a piece of quartz by Mr. D. M. Merkle that came from the '89 mine, near Holland Flat, that was very rich. This mine is owned by Cox & Downer, who have developed a well-defined ledge from six inches to three feet in width. A mill will be put up on the mine next summer.

TABER—H. Taber has resumed work on his old drift claim, the owners having recently incorporated under the name of Taber G. M. Co. The tunnel is in over 2000 feet, and work will be pushed rapidly.

San Bernardino.

TIN AND GOLD.—*Riverside Press and Horticulturist*, Aug. 15: James H. Crossman, superintendent of the Gavilan gold mines, was in the city yesterday, and in an interview we learned several items of interesting news. He stated that Col. E. N. Robinson, general manager of the San Jacinto estate, limited, started for London yesterday to meet the board of directors at a special meeting called for the purpose of inaugurating a system for "farm letting" portions of their immense property to small holders—farmers, stock-raisers, miners and other industries—the San Jacinto estate retaining possession of the tin mines situated in the vicinity of Cajalco, and systematically working them for their value. During Col. Robinson's absence Capt. Stephens will take temporary charge of the property, with the assistance of Purser Hugh Stephens. We congratulate Col. Robinson on the able manner in which he has managed this vast property, the resultant effects of which are shown in the last run of five days of the furnace, which yielded 6½ tons of metallic tin, 99 per cent fine—shipped to W. W. Stewart, San Diego, the company's agent—with immense reserves of the stanniferous product in sight on the mine.

The tin property, as a whole, has great merit, and has been pronounced not only by Capt. Harris but by all other Cornish experts who have examined it, as superior to any in Cornwall. It is also due to Col. Robinson's tact and good judgement that the company has secured so advantageous a lease of the Gavilan gold mining district to M. C. Westbrook and associates. The property leased is a principal-ity in itself, consisting of over 4000 acres of mineral and agricultural land comprising not only rich mines but a large area of rich agricultural land. This company, under the management of M. C. Westbrook, with the able assistance of the well-known mining expert and mineralogist, J. H. Crossman, will soon be placed in a condition to show results satisfactory to the lessees. What has been called Gavilan will henceforth be known as Westbrook, where a large number of miners, artisans and laborers will soon find employment. Supt. Crossman is on the ground with a force of men digging ditches, building reservoirs, clearing ground and making preparations for the reception of mining machinery for the development of the gold-bearing veins. There will be three main shafts sunk, called the Washington, the Gavilan and the Hoag, and an adit level will drain all of them. The mill-site has been selected and the town-site of Westbrook laid out. Mr. Crossman informs us that it is the intention of the company to plant trees of various kinds, fruit and ornamental, and to not only develop the mines but to beautify and ornament the place in a variety of ways.

Sierra.

EXTENSION CO.—*Mt. Messenger*, Aug. 22: Bald Mt. Ex. Co. cleaned up 123 ounces, 3 pennyweights and 18 grains for the past week's labor—only 26 drifters. One nugget weighed 11 ounces, and others, varying from one, two, three ounces and upward. About 60 men are employed at the mine, inclusive of the carpenters at work on the new boarding-house, by the completion of which the force will, undoubtedly, be largely increased as soon as more water is available for washing. An upraise has been made from the down-stream tunnel into rich gravel, and breasting commenced. Everywhere operations are progressing favorably under the efficient direction of Supt. Meikle, aided by his able and energetic foremen and a crew of as skillful and industrious miners as ever employed in Sierra county. The output of gold for August will be from \$8000 to \$10,000.

CARLSEN.—In the Carlsen diggings, a mile and a half below town, the lessees, P. C. Johnson & Sons, have struck bedrock, having sunk a hole 20x20 and over 20 feet deep, with a connecting cut for drainage, and soon drifting will be commenced.

ARIZONA.—Two men have just been engaged to

work by the Arizona Co. at their drift mine east of Forest City, beginning operations last Monday. Soon as the necessary outside labor is done, an upraise will be made in search of gravel that may be not far away. Work is being vigorously prosecuted in the Maple Grove tunnel, Kanaka Creek, Alleghany, with fair prospects of soon reaching pay gravel.

RUBY.—The cleanup of the Ruby drift mine last week was 116 ounces. Everything progresses favorably at the mine, under the able direction of Supt. Colman.

THISTLE SHAFT.—Work at the Thistle shaft, Gibsnville, is being vigorously pushed forward in the main tunnel, at a depth of 450 feet up the ridge. Thirty-five men are employed in the mine.

Tuolumne.

THE NORWEGIAN MINE.—*Union-Democrat*, Aug. 22: The Norwegian mine, situated on the northwest side of Jackass hill, two miles distant from Tuttletown, and owned by John Lawson and two sons, has been doing the fair thing lately by its enterprising and persistent owners. Last week they took out between \$1100 and \$1200, and more in sight.

Ventura.

OCHRE.—*Ventura Free Press*, Aug. 21: Three cars of red, white and yellow ochre are now being loaded at Fillmore for a large paint company at San Francisco. This shipment is a sample lot, and is taken from the Grimes mine, three miles from Fillmore. It is pronounced by experts to be of the finest quality yet marketed. It is expected that a new industry will be the result of this introduced shipment.

GYPSUM.—The gypsum mine, on the Ojai, has been shut down for about a week or two. The shaft is down about 125 feet, and in order to keep it free from gas, a pump is necessary to keep it clear. New machinery is expected shortly, and it will then start up.

NEVADA

Washoe District.

CON. CAL. & VA. MINE.—*Virginia Chronicle*, Aug. 22: There have been extracted from all parts of the mine during the week 1065 620-2000 tons of ore, of which 933 370-2000 tons was shipped to the Morgan mill and 132 250-2000 tons to the Eureka mill. The average assay value of all of the ore worked at the Eureka mill during the week (1380 tons) was \$21.67 per ton. Bullion shipped to Carson Mint \$52,851.05.

OPHIR.—1465 level: We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. A very few tons of ore have been extracted.

MEXICAN.—On the 1465 level, the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift has been advanced 31 feet; total length, 187 feet; in vein porphyry showing clay separations.

UNION CON.—The northeast drift started from the east crosscut No. 2 on the 1465 level, at a point 853 feet in from the main north lateral drift has been extended 39 feet; total length, 159 feet; in vein porphyry carrying some clay, and fine lines of quartz of low assay value.

ANDES.—On the 420 level, north drift from east crosscut No. 3 was extended 16 feet in quartz.

MCDUGALL TELLURIDE MINE.—Re-timbering west tunnel and winze. Work of extracting ore from 300 level will be resumed at an early date.

UTAH.—On the 725 level, the southeast drift from the winze station is advanced 175 feet; still continuing in clay and quartz formation.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine a total of 302 tons of ore of the average value of \$19.91 a ton. Southeast drift from No. 2 crosscut on the 650 level is in 31 feet, face showing \$25 ore. The upraise started from No. 2 crosscut on the same level is up 12 feet in ore assaying \$16 per ton.

SIERRA NEVADA.—On the 630 level, west crosscut No. 1 from the northwest drift, 571 feet from the shaft, has been advanced 40 feet; total distance, 850 feet; the formation for the last 20 feet has been softer, with clay now appearing in the face.

ALPHA.—North drift from west crosscut, 100 feet north of shaft, 500 level, is out 68 feet; face in quartz yielding low assays.

EXCHEQUER.—East crosscut on north lateral drift, 150 feet south of the north line, 600 level, is out 37 feet; face in clay and quartz.

CHOLLAR.—Extracted and sent to the mill the past week \$16 tons of ore, worth \$19.91 per ton, as per battery assays.

POTOSI.—The east crosscut, 70 feet south of north line, 1100 level, is out 47 feet, face in porphyry yielding low assays. The east crosscut, 100 feet south of north line, 1200 level, is out 58 feet; face in clay and porphyry. The east crosscut, 140 feet north of south line, 1300 level, is out 61 feet; face in porphyry. Are cutting out a station in the winze, 1400 level.

SILVER HILL.—Southwest drift, 50 level, is out 225 feet from the shaft; face in quartz yielding assays from \$10 to \$20.

BULLION.—During the week there has been no work done in the south lateral drift from the Potosi 1300 level.

WARD SHAFT.—The southwest drift from the shaft, 1800 level, is out 240 feet; face in clay and porphyry.

CON. NEW YORK.—The west crosscut, 230 feet north of shaft, 650 level, is out 20 feet; face in clay and porphyry. The north lateral drift, 1100 level, is out north of shaft 635 feet; face in quartz and porphyry yielding low assays.

GOULD & CURRY.—200 level: Upraise No. 2, has been carried up 10 feet, through hard porphyry and quartz; total height, 125 feet.

BEST & BELCHER.—1100 level: East crosscut from northwest drift has been extended 18 feet through porphyry and stringers of quartz; total length, 118 feet.

Breyfogle District.

CHISPA.—*Carson Tribune*, Aug. 19: Surveyor-General Jones received last Thursday a quantity of pay ore from the Chispa mine in the above-named district. It was discovered by Mr. Montgomery and has been thoroughly prospected. A ledge fully developed and from 2 to 14 feet wide contains ore which works from \$18 to \$30 to the ton, and the

chances are greatly in favor of finding very much richer ore. A ten-stamp mill is in course of construction and work will be vigorously pushed. The property is in Nye county in the vicinity of Death Valley. There is no foolish bling about the discovery, but all on merit.

Eureka District.

RUBY HILL TUNNEL.—*Eureka Sentinel*, Aug. 22: Gentlemen who have visited the above tunnel recently report the new find as still improving. Not enough work has yet been done, however, to determine the extent of the ore body, but the outlook is very encouraging. The work has the appearance of being on the outer edge of a good-sized body. The greater value of the ore is in gold, an average sample assaying \$22 in gold and \$2 in silver. This tunnel does not enter Ruby Hill, as its name would seem to imply, but goes for the bowels of Prospect Mountain from the west side and near the north end. The tunnel is in a distance of 1800 feet. Other good indications were passed farther back. More attention will be devoted to drifting and crosscutting from this time on.

Hawthorne District.

LAPANTA.—*Walker Lake Bulletin*, Aug. 20: The stopes above the east drift, No. 6, looking about the same. The ore found in the east drift from the winze below the 100-foot shaft level has opened out to about two feet in width, going down, and are now running another crosscut from the winze near the bottom to cut it about 30 feet deeper. The ore runs from \$60 to \$100.

PAMILCO.—Work is being prosecuted at three points; all showing well.

CENTRAL.—Still stopping above the 150-foot level, producing the usual amount of ore. Hauling ore for shipment.

MOUNTAIN KING.—North drift on main vein still being extended.

FAIRMOUNT.—Still drifting south in the main tunnel and north from the bottom of the winze. All points producing well.

HARTFORD.—Ledge holding about the same, producing lead and gold ore.

GOLD BAR.—Still producing ore, producing the usual amount of high-grade ore.

NEW YORK.—South drift on the vein being extended; vein showing very strong, carrying lead, silver and gold.

WAR EAGLE.—Are still driving tunnel ahead to tap vein below old workings, and also stopping small amounts of ore.

RIP VAN WINKLE (Marietta).—Main tunnel being extended on the vein showing eight inches of galena in the face, assaying 70 per cent lead, 46 ounces silver.

JENNY LIND (Marietta).—Vein in the north drift still continues strong, about 18 inches wide; ore improving in quality, assaying 70 to 80 ounces silver.

Tuscarora District.

NAVAJO.—*Times-Review*, Aug. 21: The work on the 350-foot level is without material change since last report. Everything running smoothly.

COMMONWEALTH.—East crosscut from bottom of winze below the fourth level extended 18 feet; total from winze, 52 feet; top of drift is cutting into the vein.

DEL MONTE.—Third level—No. 1 north drift advanced 26 feet; vein is larger; small seam of ore in the face. No. 2 north drift extended 27 feet; face of drift in vein formation giving low assays. No. 2 joint raise extended 17 feet.

NORTH COMMONWEALTH.—Fourth level—Raise from east crosscut put up 15 feet; work at this point discontinued.

BELLE ISLE.—Have started to crosscut for the vein on the 450-foot level, which recent developments indicate to be some distance beyond the present workings. The winze has been connected with the 450-foot level.

NORTH BELLE ISLE.—East crosscut from the south gangway, 400-foot level, extended 20 feet. North drift from the south-line crosscut, same level, extended 13 feet; the ore in the face continues to show more or less bright ruby. South drift, 500-foot level, extended 18 feet. No. 1 upraise, same level, extended 10 feet, showing some very good ore.

ARIZONA.

GOLD BULLION.—*Prescott Journal-Miner*, Aug. 19: Another bar of gold bullion was brought in yesterday from the Quartz Mountain mine. It is rumored that the Commercial M. Co. will shortly commence the purchase of custom ore from their Senator mill. The tunnel of the Senator mine is now in nearly 600 feet, and work on it continues to be pushed. The Senator mill is only running 12 hours per day on account of scarcity of water. Jasper Phillips, who is working the Wren mine, owned by Bigelow & Smith, on Slate creek, under lease, has been taking out good ore.

TOMSTONE M. & M.—*Prospector*, August 19: From the annual report of Superintendent W. F. Staunton, the following is taken: Shipments to the smelter for the year ending June 30th, 1891, have been as follows:

	Dry Wgt.	Contents
	Tons.	oz silver oz. gold
Lucky Cuss.	2 270.805	124 681.89 1,681.87
West Side.	1 115.252	81,004.58 1,526.61
Northwest.	458.002	3 275.46 98.69
Assay Office.	14.884	773.90 8.18
Charleston.	42.406	2,589.91 23.67
Total.	3 891.409	239,801.80 3,339.31
		Average grade per ton—
		lbs. lead oz. silver oz. gold
Lucky Cuss.	145.313	54.995 .74
West Side.	316.136	73.29 1.38
Northwest.	116.836	67.14 .215
Assay Office.	2.882	52.00 .55
Charleston.	6.666	61.67 .56
Total.	586.433	61.625 .858

Compared with the production of the previous year, the above figures show a marked increase in the total number of tons shipped and in the average grade of the Lucky Cuss ore. The decrease in the grade of the Sulphuret and Northwest ores has been more than offset by the increased tonnage, and the percentage of lead in the ores from all three mines has been much improved. Payment is received for lead only when it exceeds five per cent, and the quantity of lead given above, is only that upon

which payment has been received. More than half of the Lucky Cuss ore has contained but five per cent of lead and under. In general appearance the mines have continued practically unchanged throughout the year. While there have been no discoveries of ore bodies of any considerable magnitude, the many small ones in new localities which have been found have enabled us to maintain, and latterly to increase, our monthly output without curtailing the development work, and still leave the mine in good condition for the coming year. The development work, comprising drifts, winzes, raises, etc., has aggregated nearly 8000 lineal feet. The machinery at the various mines has been kept in good condition and improved. One hundred and seventeen men are employed at present, 96 at Tombstone and 21 at Charleston.

BRITISH COLUMBIA.

GALENA NEAR BALFOUR.—Nelson Miner, Aug. 12: T. G. Proctor, R. S. Gallop and J. E. Stark report making a find on a creek that empties into the outlet nearly opposite Balfour, the find being about five miles distant from that village. The ledge is reported of good width where uncovered, the vein matter carrying buoches of fine-looking coarse-grained galena.

THE DANDY.—Good progress is being made on the Dandy. The lower tunnel run on the ledge is being advanced nine feet a week, and the crosscut tunnel to tap the ledge about 14 feet. The latter will be about 200 feet long, and will tap the ledge about 85 feet below the bottom of the shaft. This will not only afford drainage, but allow of drifts being run both ways on the vein. The lower tunnel, when it reaches a point below the shaft, will be 175 feet below the crosscut tunnel. A. M. Esler, who is now on the ground, is not only well pleased with the way the work is progressing, but is sure that his company has a mine. Power drills will be put in as soon as it is demonstrated that the electric drills now being tried in the Cœur d'Alenes are a success, preference being given the electric over compressed air.

MINING NEWS FROM HOT SPRINGS DISTRICT.—The crosscut from the bottom of the Skyline is in very hard rock, and slow progress is being made. An indication that seems favorable to a near approach to the ledge is the seepage water, a considerable flow being encountered this week. The Number One continues shipping ore, two carloads being now on the railway wharf at Nelson, awaiting shipment to East Helena, Montana. A good strike is reported in the Saxon, a Cedar creek claim. The Crescent has a fine showing of ore in the bottom of a 45-foot shaft, but, for some reason, work has been suspended. A bond has been given on the Neosho, a claim that is believed to be one of the richest in the district, at figures up in the thousands.

MONTANA.

THE DREGGES AT THREE FORKS.—Mining Journal, Aug. 19: It is now stated that the dredges and amalgamators working the bars of the Jefferson river for gold, the enterprise, at the head of which is ex-Senator Tabor, of Colorado, are working most successfully. The plant is handling 60 yards of gravel an hour, the gold recovered averaging from 90 cents to \$1.20 per yard. One shift of 16 men is employed to operate the machinery.

EMIGRANT GULCH.—Samuel Marchington, of Emigrant Gulch, in Park county, is visiting Helena. Considerable placer mining is being done this season, which will result in good cleanups and the "boys" will be able to carry on developments of the quartz leads, there being many promising ones in the camp.

BELMONT AT MARYSVILLE.—In its palmy days the old Belmont, above Marysville, was a famed bullion producer. A report has been making the rounds of the streets recently that Helena parties have secured a lease and bond on the property, and that the mine will soon be reopened and the mill started. It is to be hoped that the rumor is well founded.

AT BUTTE.—Miner, Aug. 20: While the mining arena was not visibly disturbed by any extensive new discoveries in Butte during the week, there was variation from the customary steadiness of the regular production. Some few new leases on properties were taken, while a few old ones expired and were thrown up; but this is the case week in and week out, and what may be called the regular production is not affected at all thereby. The Moulton, Alice, Bluebird, Butte and Boston, Colorado, Boston and Montana, Butte Reduction, Lexington, Parrot and other smaller companies have made their regular shipments of copper, silver and gold, and expect to continue right along. Owing to repairs in progress at the Lexington mill, the shipments by that company were not so large as during some of the previous weeks. With many of the mining companies, repairs and additions seem to be the order of the hour. The Boston and Montana has just finished some needed repairs at the smelters, and is now engaged in the task of erecting a first-class piece of hoisting machinery on the new shaft. At the Butte and Boston, the two new O'Hara furnaces have received the finishing touches, and will be fired up for business in a day or two. The Alice Co. is making extensive improvements in the shape of the addition of a large air compressor at the main shaft. The workings of the mine are also being extended, and the shaft deepened to the 1500-foot level. The Blue Wing, Alice and Magna Charta are yielding enough to keep both mills pounding away night and day. The shipments of bullion from these works during the week were as large as during any former week. The Boston and Montana works and principal mines are running full blast. The largest portion of the ore used at the works is being taken from the two Colusas at present, that is the veins of the Moulton View and Harris-Lloyd being held in reserve. The Butte and Boston is getting to be one of the colossal companies of the camp. It started in on a small scale about three years ago, since which time it has been gradually increasing its possessions, until now it has a daily capacity of over 400 tons. In addition to one of the best plants in the State, the company has about 33 mining claims, all located within a mile of the works. These claims are all good, or the company would not own them. As to the Anaconda, nothing of a startling nature has occurred during the last seven days. The large tanks in both the Anaconda and St. Lawrence are still engaged in taking out the water, and will be for the next few weeks to come. If the mines do not

start up after the water is taken out, a few men will at least find employment timbering, cleaning up and keeping the property in shape for future use. The Wild Bill is one of the coning properties of this camp, as it is situated squarely in the copper-silver belt. All the other syndicate mines are as quiet as a graveyard, there being nothing about them that would lead one to believe that the end of the shutdown is near at hand.

THAT BIG GOLD PROPERTY.—Inter-Mountain, Aug. 19: Willard Bennett to-day received word that the five-stamp mill for the Royal Gold & Silver M. Co. was ready to start from Chicago. This is for the very valuable gold property in the Boulder district, of which mention was made in these columns recently from an interview with Mr. Turney of Anaconda, one of the principal owners. Mr. Bennett has acquired a four-sevenths interest for a consideration of \$30,000. He had a ten-pound package of ore from this property a few days ago which contained pure gold and silver, its value being \$248 in gold and \$570 in silver. The lead is termed a "blind" lead, as it is hidden under a formation of decomposed granite from 6 to 12 feet thick. This has been sluiced away in several places, exposing the rich ore. The property is three miles in a direct line northeast of Granite mountain, on Divide creek, between Gold creek and Boulder.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING AUG. 18, 1891:
457,862.—BRUSH—E. F. Chumara, Colfax, Wash.
458,101.—FLUID PRESSURE BRAKE—E. B. Denison, Pine Grove, Cal.
457,825.—WATER WHEEL—F. Lundberg, Tacoma, Wash.
458,033.—SASH BALANCE—J. P. Magney, Oakland, Cal.
458,060.—WAVE POWER—W. Mulholland, Los Angeles, Cal.
457,935.—HARNESS.—J. R. Phelps, Sacramento, Cal.
458,120.—INSERTED SAW TOOTH—Rogers and Howe, Laurel, Cal.
457,937.—DENTAL ARTICULATOR—C. R. Sabin, St. Helena, Cal.
457,938.—MACHINE FOR SHAKING LIQUIDS—R. D. Schroeder, S. F.
457,939.—LOCOMOTIVE.—Paul Seiler, S. F.
458,076.—PUNCH—F. N. Simmonds, S. F.
457,882.—WINNOW CHAIR—E. T. Steen, S. F.
457,940.—FRUIT PITTER—W. Stevenson, Vallecito, Cal.
457,803.—CARBURETOR—O. Vanorman, Los Angeles, Cal.

The following brief list by telegraph, for Aug. 25 will appear more complete on receipt of mail advices: California—Peter Abramson, S. F., fire chamber vent; John W. Baker and J. Lacy, Bakersfield, cutter bar attachment; William H. Bast, Olinia, square for rafter and stair work; Naaman L. Darling, assignor of one-third to J. R. Dixon, Los Angeles, harvester; Adolph L. Gerleke, Sonoma, farm gate; Clarence V. Greenmeyer, S. F., electric power brake; Adam Harford, Colton, wheeled road car; Heber L. Heath, S. F., elevator; James M. Ish, S. F., fruit-grading machine; David B. Jones, S. F., quartz mill; Milton W. Lipe, San Jose, flour packer; George F. Mo'n, Los Angeles, electric uterine supporter; Moore Noble, S. F., vapor formig attachment for grates. Oregon—Addison Goodrich, Astoria, packing extractor.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

MACHINE FOR SHAKING LIQUIDS.—Richard D. Schroeder, S. F. No. 457,938. Dated August 18, 1891. This is one of that class of machines which are used for holding and shaking a receptacle in order to thoroughly agitate and mingle the ingredients of beverages and other liquid compounds. The object of the invention is to provide a simple and effective machine of this character adapted to readily receive the shaker and tumbler, and to hold them tightly while being vigorously vibrated.

STUMP PULLER.—Wm. B. Morris, Seattle, Wash. No. 457,092. Dated Aug. 4, 1891. This is an improved apparatus for extracting stumps, pulling heavy weights or for other similar heavy work. It consists of eccentrics or cranks fixed to a suitably journaled shaft with means whereby it may be anchored and rotated, and a draft bar with automatically operating locking devices, whereby each of the eccentrics alternately pulls upon the draft-bar. It also consists in a means for taking up any slack rope and in certain details of construction.

HARNESS.—James R. Phelps, Sacramento. No. 457,935. Dated Aug. 18, 1891. This is a device which is intended to give the proper gait to horses when traveling and prevent their interfering or hitting themselves. The gaiting device consists of swinging arms, a means of connecting their lower ends with the horse's legs, and journal boxes within which the upper ends of these arms are swiveled to turn or oscillate, a forked supporting frame for said journal boxes having its separated ends extending over the horse's back, and means for connecting said ends to the harness or vehicle shafts whereby the device is supported and steaded.

DENTAL ARTICULATOR.—Chas. R. Sabin, St. Helena, Napa Co. No. 457,937. Dated August 18, 1891. This device is used in the manufacture of plates of artificial teeth. In the process of preparing dental plates, the usual steps are to take an impressio of the mouth in suitable plastic material, to make from said impression the models, usually of plaster, to take another impression of the mouth in wax in order to make the bite or articulation to fit the wax impressio to the plaster models and to place the whole model of the mouth in the articulator. There is always a difficulty in getting the bite or articulation, and unless this be done suc-

cessfully, the resulting work will be imperfect. The chief difficulty arises from the inability of the patient to control the movement of his lower jaw with sufficient accuracy to make a perfect and natural articulation. It is the object of this invention to avoid this difficulty by the provision of means which will insure this accuracy and give a proper bite or articulation.

LOCOMOTIVE.—Paul Seiler, S. F. No. 457,939. Dated Aug. 18, 1891. This invention relates to certain improvements in locomotive engines whereby the application of power and the effective tractive force of the engine are greatly increased. It consists in the employment of two sets of wheels of equal diameter, one set running upon the track and the other journaled directly above the first set, with their peripheries traveling upon the peripheries of the lower set, the weight of the engine being entirely carried upon the axles of the upper set of wheels. Both sets of wheels are connected together by the usual side-rods, and each set is independently connected with the single cross-head, which is reciprocated from the cylinder in the usual manner. Power being applied through the cylinder to the cross-head, the action will then take place equally upon both sets of wheels, the cranks being alternately in the position nearest to each other and farthest away, or upon the opposite sides of the centers of the wheel. When power is applied through a crank to a wheel traveling upon the rails, it will be manifest that when the crank is at the highest part and farthest away from the fulcrum (which is represented by the rail upon which the wheel travels), its power for propulsion is the greatest; but when, by a half revolution, it has arrived at a point between the axle and the rail, the leverage becomes such that the least power to move the load can be applied, and the tendency of the wheels to slip is at its greatest when the cranks are in this position. By Mr. Seiler's construction, it will be seen that when the cranks connected with the lower set of wheels are at the lowest point, those connected with the upper set of wheels are at the highest point and are consequently in position to apply the power to that set of wheels to the greatest advantage, while the power is being applied to the lower set of wheels with the least advantage. By reason of the whole of the weight being supported upon the journal boxes of the upper set of wheels, it will be manifest that the weight is transferred through the peripheries of these wheels to the peripheries of the lower wheels, and by frictional contact the power is transferred to the peripheries of these wheels, thus applying it constantly at a point which is at the greatest distance from the fulcrum.

FRUIT-PITTER.—Wm. Stevenson, Vallecito, Calaveras Co., assignor of two-thirds to Luke Sanguinetti of same place and David Barattini, of Murphys. No. 457,940. Dated Aug. 18, 1891. The present machine is an improvement on patent No. 417,885. Dated Dec. 24, 1889, issued to Sanguinetti and Stevenson. The fruit is placed in a V-shaped feed-chute and on account of this V-shape and the corresponding V-shape of the guide piece, the fruit is fed down in the same way each time, so that each fruit will be cut uniformly in the center—that is to say a guide is thus provided for feeding the fruit centrally to the knives. The fruit is held by a blade, and as the cutter rotates its knife-like points cut the flesh of the fruit to the pit, so that said fruit is divided, and both the halved flesh and the pit drop into an inclined shaking screen, through the meshes of which the pits drop, while the flesh passes down the screen into a suitable receptacle below.

Mining Share Market.

The mining share market the past week, showed continued dullness in outside mining shares, with hardly a cross-order to establish quotations. In the comstock there was more life through cross-orders. The pool finds it hard work to draw in outsiders to operate, although every little while they do manage to hook a gudgeon, but these being "small fry" they are soon financially done for. Report says that the threatened Iowa claim dispute has been compromised, but with the threatened suit by West Con. Virginia and the suits already in court, against the Savage Mining Co., and another against the Hale and Norcross management, it is hard to get up any kind of enthusiasm, particularly when outsiders believe that the mill rings are still in the ascendancy, and that as long as the latter control the former can only look for assessment for share holders and bullion for the rings. It was hoped that Col. Mackey would give personal attention to the serious charges preferred against the rings, so far as his and Com. Flood's particular mine is concerned, but so far we are not advised that any such action has been or is contemplated; yet for the good of the mining industry and his own keen sense of justice, we still think that the Colonel will investigate the charges and not be swayed by others. If the mines and mills are honestly worked, the officials should court an investigation, and if they are not so conducted, then the sooner it is known and the wrong righted, the better it will be for our leading industry.

The owners of the mills running on ore from the Gold Hill and Middle mines have the writers heart-felt sympathy in this, the hour of their bereavement over the lack of water to operate the mills, so as to run the mines in debt while crushing ore.

Rumors are flying thick and fast, and to ferret them out is more difficult than to catch a feather in a gale of wind. The latest put out is that Col. Mackey will leave soon for the East. While this may be so, yet he seldom, if ever, misses being here at Con. Virginia's annual elections.

The news is of a very encouraging character from the mines in the Tuscarora district, while from the Bodie district our advices report more prospecting work. Who knows but in the latter district, but that they may run into a blind pocket for which it is noted. From the Comstock mines our advices continue of a favorable character. The shutting down of some of the mills will probably cause more prospecting work in the mines affected. The successful killing of time by the persons who have charge of the pumping out of the Gold Hill mines, is causing a spasm of envy from those who would also like to draw a good salary for virtually doing nothing. The work going on in Sierra Nevada and Union, is attracting more attention, and hopes are expressed that good results will follow. If it does, who will

get the benefit, the mill rings or shareholders? Advices report that on Con. Virginia 1800-foot level a west drift has been started. If this is the case, they ought to strike the west lode within the next month. On the 1100-foot level important work is contemplated, yet the management is singularly neglectful of the 1400 level. Why is not this level prospected? In Best and Belcher and Gould and Curry the work is being closely watched. On the 1500 foot level in Savage, the prospects look very encouraging. Hale and Norcross does not report any movement calculated to show up the ore found to the west. The west work on the 1800-foot Ward shaft level ought soon to be approaching an interesting point. The usual kind of work is reported from the Gold Hill mines. The managers of these mines can do much better, if so disposed.

The share market opened this (Thursday) morning dull but strong at a slight advance. The slow but steady growth in prices for the Middle and North End shares is a puzzle to on-looking but anxious outside operators. The latter are expecting something, but what, whether a break or a jump, is not clear to their minds, and to add to their perplexity, Senator Fair comes to the front in the newspapers in a squabble over an electric road. The man who failed to sell when Con. Virginia went up to \$20, expecting it would not be a sell until some one of the Senator's schemes was lauded by the press is in sore distress of mind; he does not know whether to buy more stock or sell what he has. The market acts as if there is a short interest, which, if correct, will send prices up before there is a break.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 27, 1891.

General trade is exceedingly active. The volume of goods going out is larger than at the like date within the history of the city (this information is obtained from various transportation companies). The money market is easy, considering the heavy demands to be met, but with the flow setting this way, the market will be unusually easy. Our advices are confirmatory that interior merchants are getting into better financial condition than for several years. This is due to farmers being free sellers of produce, particularly grain, and for which higher prices are being realized than for nearly ten years. With higher prices for grain and a large crop harvested, the outlook is extremely favorable for a more prosperous year in all industries than ever before enjoyed.

MEXICAN DOLLARS.—The last steamship for China took out \$315,744. The market is reported at around 78 cts.

QUICKSILVER.—Receipts aggregate 202 flasks. The market is essentially unchanged.

SILVER.—The steamer Oceanic took out \$40,000 in bullion for Japan. The market, after falling to about 98 cents, appears to be strengthening. The low range of values in this country and abroad is, to many, a source of surprise. The depression in the face of this country's heavy purchases, bears the ear-mark of a speculative combine, particulars of which will probably crop out later on. There are many speculative securities whose market values are contingent upon that of silver; and with the latter selling at low figures, these securities can be picked up to a much better advantage. The output of the mines in this country does not show any increase, but, on the contrary, there are those who claim that it is less. Probably the pending elections in the Central and Eastern States has much to do with the present situation of the metal.

BORAX.—Receipts the past week aggregate 225 cts. The market is easy, with inside figures now outside figures.

ANTIMONY.—The market continues to shade off.

LIME.—Receipts the past week aggregate 2600 bbls. There is a continued active demand.

LEAD.—Locally, there is nothing new to offer. The Eureka mine is turning out considerable, which finds a ready market.

IRON.—The market is cleaning up, but heavy shipments on the way are against the selling interest. The movements of all kinds of manufacturers to combine against strikes is accepted as favorable and which must unquestionably lead to better times, for, with fears of strikes, business was unsettled. An exchange says that the Great Western Iron and Steel Works at Kirkland (Wash.) is building a blast furnace 75 feet high, with a 17-foot bosh, and will have a capacity of 1000 tons of pig iron per week.

TIN.—The market is strong for plate but weak for pig. The latter sells at about cost of delivery, and to force sales even less has to be accepted.

COPPER.—The market is gaining strength. London cables to Iron Age reports as follows: Copper has ruled stronger under the influence of a good demand for cash warrants and moderate offering following somewhat heavy "bear" selling early in the week. The turn has encouraged operations for long account, and freer buying on the part of consumers, together with good statistical position, has also helped to stiffen the market.

COKE.—The market continues in buyer's favor. Imports the past week aggregate 621 tons from Glasgow. Large consignments are reported on the way.

COAL.—Imports the past week aggregate from Comox, 8700 tons; Seattle, 458; Tacoma, 2909; Carmelo, 200; Coos Bay, 700; Nainaimo, 6201; Departure Bay, 7173; Swansea, 2525; Glasgow, 1090; Sydney, 1920. Total, 35,775. As will be seen by the above, we have added Carmelo to our source of supply. The coal is bituminous. The market for spot and nearby is barely steady, while for shipment, the lower prices are obtainable on a firm offer. The consumption with us is all of 25 per cent greater than at this time last year, but with all the coast from mines resuming work and heavy shipments from abroad, it looks as if the supply will be ample. The coal ships on the way to this port have a registered tonnage, as follows: From Australia ports, 76,503 tons to this port and 17,955 tons to San Diego. Besides this, there are many cargoes on the way from Great Britain. The offering of vessels at Australian ports for coal loading is quite free.

MECHANICAL PROGRESS.

Manganese Steel.

At the late meeting of the American Society of Mechanical Engineers a very interesting paper was read by H. M. Home of Boston on Manganese Steel, from which the following is condensed:

Manganese steel is an alloy of iron and manganese, containing a considerable portion of carbon. It possesses a remarkable combination of great hardness, which cannot be materially lessened by annealing, and great tensile strength, with astonishing toughness and ductility. Resistance to abrasion, to indentation by a sharp object, and to compression, habitually go hand in hand. The alloy is hard, but under some conditions not rigid. An instance of rigidity under shock is that of a manganese steel axle, compared with a special carbon steel axle. Each was struck repeatedly by a 20.75 cwt. ram while resting on supports three feet apart, and each was reversed after every blow, in the usual way. The manganese steel axle received, up to time of breaking, blows representing 43 per cent more energy than those received by the carbon steel axle, yet the total deflection of the former was very much less than that of its competitor.

A case of good behavior under shock is furnished by a 33" m-st. car wheel, weighing 612 pounds. It was dropped edgewise on a one-ton steel block, heeded in the ground, from gradually increasing heights, and the same thing was done with an American chilled cast-iron wheel, and some excellent carbon steel wheels. The total energy represented by the work done on the manganese steel wheel was 100 foot-tons, or twice as much as in the case of cast iron, and twice the amount as in the case of carbon steel.

Manganese steel axles have chopped cold iron bars through. The metal can be worked easily by emery wheels. The most important single use for manganese steel is for the pins which hold the buckets of elevator dredgers. Here abrasion chiefly is to be resisted, and it has given remarkable results. Manganese steel wheels, under a one-horse tram car in Chester, England, were returned after running 180,000 miles. The service under horse cars is very trying, as the brakes are so often applied, and as so much sand and other gritty matter lies on the rails. Some manganese steel wheels have run 300,000 miles each, on a N. E. railroad, without being turned down. Manganese steel can advantageously be used for gears, safes and armor plate.

In the discussion, M. G. C. Henning said that, although manganese steel seems to be very soft, it is found to be tough and hard when crushed. Prof. Rogers and Wm. Kent spoke briefly. President Hunt thought the subject of car wheels important. The aim in this country was to replace the tired wheel by a solid one.

THE CATLIN RAPID-FIRING GUN is the invention of a mine superintendent of Nevada. The gun has a Winchester hand and stock with a 15-repeating magazine in the stock. It is a trifle heavier than the ordinary Winchester, but its great feature, as claimed, is that the whole 15 shots may be fired in one second. This statement may not seem possible, but is claimed to be an actual fact. The shells are thrown out, and at the end of the firing the gun is as clean as though only a single cartridge had been exploded. It is said that an instantaneous photo was taken of the gun in action, and while the explosion was made, five shells were in the air tossed out by the inconceivably rapid working of the gun. All that the man who does the shooting has to do is to fill the chamber with cartridges, cock the gun and then pull the trigger as many times as he means to shoot. The gun is accurate at short or long range.

A NEW ALLOY.—A telegram from Pittsburg of Aug. 17th says that a series of experiments by Thos. Harrington of that city into the properties and uses of nickel steel and manganese bronze have resulted in the discovery of a metal the chief characteristics of which are that it obtains a very high tensile strength and is indestructible by corrosion, being impervious to acids, and that it can be wrought into spikes, nails, etc., while either hot or cold.

A NOVEL HOUSE STOVE is being introduced in England. The grate is swung on trunnions and can be reversed. After fresh coal has been added at the top the reversal is made, and the green coal is thus brought to the bottom. The consequence is that the gases from the coal, passing upward through the red portion of the fire, previously at the bottom, are almost entirely consumed before reaching the chimney.

AN ANCIENT BOILER.—It is said that a boiler that must have been in use some 1800 years ago is exhibited at a museum in Naples. It was unearthed at Pompeii, and is described as being of copper, of small proportions, with a fire-box, a smoke flue through the top, a door on the side, and water grates of small copper tubes crossing the fire-box at the bottom.

WHEN SELECTING PULLEYS or belts, don't be afraid of having the face of the pulley or the belt too wide. Economy will be found in the use of wide belts, if not carried to extremes.

Massive Box Girders.

There has been an interesting piece of work going on for the past three or four months upon the top of the northwest wing of the New City Hall, 80 feet above ground. This work consists of the putting together of what are said to be the largest box girders ever constructed. They are too large to be constructed at any shop or even on the ground adjacent to the building, for the reason that it would be impossible to raise such great weight to put in position, except at an enormous expense of special hoisting gear.

There are five of these girders to be put in place. Two of them are 126 feet long, two others 107 feet, and the fifth 72 feet in length.

A contemporary alludes to this work as follows: The two largest are especially worthy of mention, there never having been equally big box girders placed anywhere. They will have to carry a weight of 300 tons, consisting of the masonry story and the roof of the wing, leaving a clear space underneath for what is at present intended to be an assembly hall. The clear space between the bearings of these girders will be 116 feet and 9 inches. They are six feet nine inches high, 3½ feet wide and weigh 125 tons each.

Forty workmen are employed constructing the girders of steel plates and angles. These are riveted together with hot steel rivets one inch in diameter by an air-riveter with a pressure of 38 tons to each rivet.

An idea of the greatness of the undertaking may be formed when it is said that 35,000 rivets are to be used, weighing 40,000 pounds, some of them being seven inches long. The plates are from 29 to 50 feet long, and from three and one-half to six feet wide. They are three-quarters of an inch thick.

To carry out this work, \$4000 worth of machinery had to be procured and a scaffolding containing 12,000 feet of lumber had to be constructed.

On the ground floor are a hoisting engine, a hoiler and another engine to run the furnaces for the riveting machine, with an air tank and a compressor. On top of the wing, the hand forges and furnaces for heating the rivets are located, besides the riveting machine, which is run by compressed air brought in pipes from the tank below, under a pressure of 75 pounds to the square inch.

The contract price for the work is \$62,449, and the girders will be completed, barring unforeseen events, by Sept. 1st.

All the work is done in this city, with the exception of the plates, which had to be imported. Even the machinery used has been manufactured here.

THE CUSHION CAR WHEEL.—The latest invention to attract the attention and approval of railroad men is the cushion car wheel, which is said to possess many advantages in the way of simplicity, safety and economy, while at the same time being almost noiseless. The wheel is composed of two parts, the centre and the tire, while between the two is a thick rubber band which acts as a cushion to absorb all the vibrations. By a peculiar construction, the tire is made so that it may be removed without taking the wheel from the axle. The rubber is so interposed between the centre and the tire as not to be liable to injury from a hot box or from the corrosive action of the lubricants. A test recently made with these wheels showed that after a service of over 20,000 miles the rubber had not deteriorated, while the tire showed a wear of but a thirty-second of an inch, which is said to be less than one-half the usual wear for this distance.—Boston J. of C.

IMAGINARY DEFECTS.—Many a machine is condemned as worthless or inferior and set aside, not because of actual defects, but because not properly set up or proper connections made. Before condemning an old and well-known machine, one should stop long enough to reflect that hundreds of other people have made the machine operate successfully, and that it is extremely unlikely that the machine contains some mysterious defect which renders it a failure in that individual case.

SHAFTING is cold rolled to the even diameters, and when finished is reduced by the finishing out to about one-sixteenth of an inch less than the nominal diameter, so that when a two-inch finished shaft is ordered, it will come one and fifteen-sixteenths. It is well to bear this point in mind when ordering pulleys bored out for special sizes of shafting. The extreme lengths of shafting ordinarily are from 18 to 20 feet.—Power.

LARGE CRANES.—Some of the monstrous cranes used in the Baldwin Locomotive Works at Philadelphia lift a big locomotive as easily as a mother does a baby. Each of them saves the labor of 150 men, and does away with the necessity of having a complicated system of tracks for shifting locomotives.

SMALL ARTICLES made of malleable iron are now finished and polished bright by being placed in revolving drums with coriander shavings, from which they emerge with all of the rough edges smoothed and the surface highly polished.

PAINT FOR ZINC.—For paint to stick to zinc, use the following wash: Chloride of copper, one part; nitrate of copper, one part; sal ammoniac, one part; water, 64 parts. This coat is left for 24 hours before applying the paint.

SCIENTIFIC PROGRESS.

Mountain Storms, Cloud-Bursts, Etc.

Severe mountain storms and destructive cloud-bursts seem to have been unusually frequent of late in all parts of the country. The vicinity of the flourishing town of Redlands in San Bernardino county has been twice visited with a cloud-burst within a few days, which sent its waters rushing through the center of the business portion of the town, doing but comparatively little damage, however. The mountains back of San Diego were also visited by a very severe cloud-burst, which rushed, with a perpendicular wall of water several feet high, down a ravine, completely obliterating a small cluster of mountain dwellings which it encountered. Fairbanks in Arizona has been almost wiped out of existence by one of these cloud-bursts. Many other places northward along the track of this meteorological disturbance had also suffered minor loss, while storms of lesser violence and destruction have frequently been observed in the mountainous regions of San Bernardino and San Diego counties, during the past two or three weeks, from Oregon to Mexico. Unusually destructive storms have also visited the valley of the Platte river and other localities east of the Rocky mountains.

Salton Lake Not Responsible.

Much comment and correspondence has been indulged in to show that the newly formed Salton lake was responsible for these somewhat unusual meteorological disturbances; but Professor Finley of the Weather Bureau has shown conclusively that such could not have been the case. He has shown by the file of weather maps in his office, which covers and immediately precedes the period of these storms, that phenomena quite apart from the lake have been the cause of these "cloud-bursts" and unusual downpours of rain. He shows that for weeks there had been a condition of vertical air currents producing a barometrical trough extending from British Columbia to Mexico, which currents sent upward enormous quantities of moisture, to which Salton lake had only contributed a mere moiety, but which, when the electrical and atmospheric conditions became favorable, had suddenly condensed and fallen, with disastrous consequences, upon the mountains. The impending occurrence of these storms had been quite accurately predicted by the Weather Bureau observer in this city. Professor Finley had sent out daily bulletins announcing rains in Southern California, and had even forwarded special bulletins to Redlands.

Tornadoes and Cloud-Bursts.

The Rocky and the Sierra mountain ranges are generally considered as the most remarkable of the tornado regions of the globe. The subject of tornadoes and cloud-bursts, especially in the United States, has been for many years made a matter of special study by our meteorologists, and the most minute, systematic and careful observations in relation to them have been recorded, tabulated and studied. Up to within about six years and for the previous period of 87 years, about 600 tornadoes have been especially noted and recorded. Of course, the larger number of these phenomena occurred during the last half of the period mentioned or since the advance of population has moved westward into the more central portions of the storm regions of the continent, affording the opportunity for wider observations. There are three great centers of storm regions in the United States which probably hold good also, as the three chief storm centers of the entire continent. The first and most important has its center a little to the north and west of the junction of the Missouri and Mississippi rivers. The second in importance is in the Allegheny mountains, near the western junction of the boundaries of North and South Carolina. The third is in the central portion of western Texas.

THE AMOUNT OF MOISTURE in the atmosphere is much greater than is generally supposed. Its capacity for sustaining moisture, depends mainly upon its temperature. The atmosphere at 100° F. at the earth's surface is capable of sustaining, in an invisible form, moisture to one-fiftieth of its weight—or an equivalent of one pound of water to every inch of area. Hence it will readily be seen what an immense volume of water may possibly be discharged over any given area, when the atmosphere and electric conditions are favorable for its sudden condensation, as in the case of what are called "cloud-bursts." Warm currents of air, highly charged with moisture, are frequently wafted by the winds over mountains where they meet with a cold atmosphere or a cold current which suddenly forms dense, black clouds, that sometimes drop their moisture in perfect cataracts of rain. These phenomena are usually termed "cloud-bursts," the waters from which find their destructive way down mountain canyons to the plains below, as recently occurred in Redlands and other places in various portions of this State.

DO CLOTHES MAKE A BOY?—"Do clothes make a boy?" No; clothes make clothes. What are clothes? They are an expression of character. A boy who respects himself will dress as decently as he can, simply and cleanly, says Ezekiah Butterworth, in the *Ladies' Home Journal* for August. A boy who respects

the worth of life will not dress conspicuously, even if he have the means. He is best dressed whose appearance excites no special attention and causes no critical remarks. Conspicuous dress goes with a light head, and a very indolent purpose in life. Dress does not make the boy, but it often exhibits him; theatrical dress in society is in bad taste; but everyone owes it to others to look as well as he can. Neglected dress shows a want of self-respect and a lack of self-respect arises as a rule from a sense of cheapness of character. It is often impossible for a poor boy to dress as well as he would wish. But he can always express his well-dressed character by making his clothes neat and tasteful.

Mold on Jam—An Interesting Study.

One of the forms most familiar to us in home life is the *Mucor mucedo*, which attacks our jam. I saw a pretty specimen of this a couple of years ago, when visiting a country house in Shropshire. I was called into the store-room of my hostess to condole with her on the moldiness of her jam. On looking about for an explanation, I found that the kitchen chimney passed up the side of the wall where the jam was kept. Here was favorable condition number one. As I have frequently observed that home-made jam was left to itself for a day or two before being covered, it was not difficult to conjecture condition number two. Indeed the jam pot an exquisite little colony of mildew was flourishing. The jam was more than half gone, shoored into the vitals of the miniature forest.

To prove to my hostess how easy it was to produce a crop of molds on any suitable media I cut a piece of bread from a loaf, moistened it with water, and, to give it the darkness which it prefers, I placed it in a muffin dish with the lid on. Carrying my extemporized laboratory to the warm corner where the jam had stood, I awaited with deep interest the frothifications of the seeds which no eye had seen and which no human hand had sown.

On the second day signs of development had begun, not in one spot, not equally all over, but in scattered dots over the surface of the bread, much like the gelatine plates in the hospital wards. On the third day my garden had burst into flower, and was radiant with molds of varied and exquisite color. Next day my little garden was still quite gay with pink, yellow, violet and dark molasses, all trying to crowd each other out. About the fifth day the little world within the muffin dish was demonstrating the great law of nature, that "all that has lived must die," in that the pabulum which gave life was exhausted and consumed. My brilliant molds were dead, and in their turn were supplying pabulum for another set of organisms awaiting the necessary conditions of their life. At the end of a week all was a jumble of life and death, the bread was being rapidly liquefied and dissolved away in a duttery-looking mass. The result of this activity was so extremely unpleasant that I was glad to seek the aid of mother earth, the great deodorizer, and to bury my experiment in the ground.

These little intruders appear before us in many domestic and questionable shapes. For instance, when the milk turns blue and sour, or when the milk turns red instead of blue. Even bread is known to turn red under their influence, and Dr. Prudden of New York in his charming little book describes the terror of a hoarding-house cook, who, on going to her ladder, found her sausages all turned red; "a fiery effigy which seemed to her more like the quondam spirits of their mysterious ingredients than the noxious, homely friend of the homeless hoarder." This phenomenon is due to the same species as that which brings about the miracle of the bleeding host, by turning the water red, and it also causes rain to turn red under certain favorable conditions. It is now cultivated in the laboratory, where it can be seen leaping from the culture media in small droplets like blood.—*Nineteenth Century*.

CURIOUS EFFECT OF ELECTRICITY.—We often read that after severe tornadoes, a strong electrical character, chickens have been found completely stripped of feathers, while at the same time the fowls are often not seriously injured otherwise. The question is how were the feathers removed—by the wind?—that would seem to be impossible. An explanation of the phenomenon has recently been suggested as follows: Place a man or a woman on an insulated stool so that the electricity will not pass through the body to the earth, and then heavily charge the body with electricity and every hair of the head, even a woman's long hair, will stand out like iron spikes or the elzed hair of the Circassian show girl. No doubt, remarks the *Forth Worth Gazette*, if the electric charge should be increased it would drive every hair out of the head, and this may be the reason that so many chickens are stripped by tornadoes.

A NEW TYPEWRITER.—A Battle Creek (Mich.) man has patented a typewriter for musical composers. The copy which it makes can be photographed and a plate reproduced for printing, which is said to be much better than plates made in the ordinary way.

CONCENTRATED OXYGEN.—Nitrate of potash (saltpeter) is said to hold in one volume as much oxygen as 3000 volumes of ordinary atmospheric air. Hence it has been called "a magazine of oxygen in a solidified form."

GOOD HEALTH.

Death Rate of the State.

The monthly report of the State Board of Health shows that in 66 cities, towns, etc., aggregating a population of 695,866, there were 1096 deaths during the month of July. There were 141 deaths due to consumption, 45 to pneumonia, 12 to hrouchitis, 5 to congestion of the lungs, 16 to diarrhoea and dysentery, 62 to cholera infantum, 89 to other diseases of the stomach and bowels, 34 to diphtheria, 10 to croup, 38 to typhoid fever, 45 to cancer, 80 to heart diseases, 12 to alcoholism and 507 to other causes. The percentage is 1.57 to 1000.

Cancer.

We would call special attention to the rapidly increasing proportion in this city of deaths from cancer. Forty-five deaths in one month is a fearful loss from this dreadful malady. The loss from diphtheria was only 34, and yet our Board of Health has seen fit to issue a special bulletin in regard to its cause and cure, which is well and good; but how about the far more dreadful malady to which we have referred? Would it not be well for the Board to look into that matter a little also? It has been repeatedly asserted that cancer, in its worst form, is being constantly cured in this city, not by the harsh and barbarous means of the knife and plaster, but by purely constitutional treatment—so mild that absolutely no suffering whatever is imposed upon the patient. There are scores of people in San Francisco who have been so cured after the regular faculty had given them over as past all hope. Now, would it not be well for our City or State Board of Health to inquire into this matter also, and denounce the claim or imposition if it be such; or if it should prove a reality, make known that fact and thus bring the good news to ears of the 400 or 500 cancer patients now suffering in this city without hope of relief. The treatment can be witnessed by any one—professional or not—every day in this city, and the Board of Health knows where, and can easily satisfy itself in regard to its truth or falsity by a little careful inquiry. We can assure them that steps will be immediately taken to give the remedy to the world as soon as the faculty will take the trouble to ascertain the truth of the matter, if their verdict should be favorable. The proof of its reality is already abundant, and additional evidence can be obtained in any way and manner that wisdom may point out. Can our city officials or the Executive of the State, even, find a more important subject of inquiry? Is not the indifference of the City Board of Health to this matter a neglect of official duty, and one which might with propriety be brought to the attention of the present grand jury, which is expected to take a very broad view in looking into everything pertaining to the health, morals and general well-being of our city?

Fatal Effects of Pickles and Vinegar.

The following, which we clip from an exchange, is worthy of the most careful consideration of all housewives, mothers and our numerous pickle-loving readers:

"We have known for a long time that vinegar was a bad thing; a medical writer says that even when it is used in tolerable moderation it causes 'intestinal irregularity, constipation, diarrhoea, flatulence, cough, watery eyes, etc.," and that persons with feeble digestive organs had better do without it.

"A friend of ours knew a young lady who was troubled with an excess of fat, but otherwise was in good health. Some one advised her to take vinegar, which would reduce adipose. She did so, and was delighted with the result. The fat rapidly disappeared; but, unfortunately, the process did not stop there; the girl continued to waste away, losing tissue rapidly, until she was almost a skeleton. Then tuberculosis set in, with disorganization of the lung tissue, and in the space of three months she was a hopeless consumptive. The disease progressed rapidly, and the grave soon claimed its own.

"It is said that pale, anemic girls are fond of pickles. The girls that are in the habit of eating pickles are apt to fall into a decline, and the first thing their friends know the case is past remedy. The strong acid, with the pungent peppers, etc., that are in the pickles, break down the digestive organs and cause emaciation. The blood, too, becomes deteriorated in quality and a diseased condition is the result. Why do people persist in eating things that are not only absolutely worthless in point of nutrition, but positively injurious to health?"

Eating.

Most people eat too much and too often. Frequent eating keeps the food constantly passing into the digestive tract, and, little by little, it is strewn along the alimentary canal, and when the bowels move, if they move at all, there is but little passes away at a time; whereas, if the same amount of food had been eaten at the proper times, the bowels would have the proper amount of debris to stimulate them into healthy action, and there would be no constipation. Again, this frequent eating keeps up a physiological congestion which in time passes into a chronic congestion, and the

person becomes sore on pressure throughout the region of stomach and abdomen.

When the individual is eating a little every hour or two, we find at the end of the 24 hours an excess has been taken of the needs of the organism. This excess is liable to be converted into fat, or, of certain kinds of food, into biliousness. Should the system at last be able to take on no more fat, it is retained in the blood and the blood vessels are distended thereby. This is thrown off by fits of sickness which we call colds, but which are nothing more or less than catarrh. This too fatty condition of the system is liable to cause pneumonia and consumption; the work of the heart is increased, and finally becomes difficult, causing a congested and inflamed condition of the lungs. The kidneys and liver enlarge from the extra amount of work they are called upon to perform, and later the surplusage passes to the muscles and joints, until the person becomes stiff, heavy and sore.

We invite all to come to the Retreat, where they may become better able to understand how to eat, what to eat, and learn the many evils people bring on themselves by eating too much. It is our constant aim to teach the truth on these things, and show how we fail, as did our parents in the garden of Eden. Let all who wish to know more take the *Health Journal*, and come here, where we will make them welcome, and where they can store their minds with useful knowledge. They may thus prove a blessing to those whom they may thereafter be associated with.—*Health Journal*.

USEFUL INFORMATION.

IS THE DIAMOND OF METEORIC ORIGIN?—Investigations made some 15 years ago tended to support the conviction that the diamond might be of cosmic origin. Later, in the year 1887, an English mining expert contributed to current literature some notes in which he showed that the motherstone of the diamonds in South Africa bore a remarkable resemblance to certain meteorites, of which he had had the opportunity of making a close examination. Finally, in a black meteoric stone which fell at Nowy Uraz, Russia, and a piece of which is preserved in the Vienna Natural History Museum, there were found small crystal diamonds representing one per cent of the size of the stone. But the really useful commercial diamond is only found in a zone running through Southern Asia, South Africa and South America, where the conditions of the surrounding earth often seem to confirm the aerolite theory. In South Africa the majority of the diamonds are found at a good depth below the surface, and the burnt track of the meteorite may frequently be traced in the soft soil. On the other hand, particularly in Brazil, mines are heard of which have become completely exhausted after a short working, pointing to the probable circumstance that the diamond-carrying meteors have, in this case, been of comparatively small size, or have fallen upon extremely hard rocks, on which they have at once been dashed to pieces.

OUR MANUFACTURES.—Although the census reports relating to manufactures have not yet been published, they have been sufficiently completed to warrant an estimate and furnish some very interesting facts for our consideration. According to the estimate as made by Superintendent Porter of the Census Bureau, the capital invested in manufacturing enterprises has doubled in 20 years, and the amount thus employed is put at \$4,600,000,000. The value of products from the employment of this vast amount of capital is put at \$5,600,000,000; an increase of about 60 per cent over the figures for 1880. The amount of wages paid has increased at the rate of \$50,000,000 annually, and now amount to about \$1,500,000,000, and the number of wage earners has increased about 900,000 in the decade. These figures make a showing which is hardly to be comprehended, but they represent an industrial progress which is unprecedented in the world's history, and leaves little for croakers to growl over.

PIO IRON FROM BOSTON TO LIVERPOOL.—An event of unusual interest, and one which may result in something of a revolution in transportation interests, recently occurred in Boston, when a contract was made by the Warren line of steamers for the transportation of a large amount of pig iron from that city to Liverpool. This is the first contract of the kind recorded, and the result will be watched with interest, as, in case it proves successful, as it undoubtedly will, it will materially assist in building up our shipping interests. An exchange says this seems like carrying coals to Newcastle, but it may be the beginning of a revolution in transportation interests.

TO TEST SEWER OR DRAIN PIPE.—A unapert joint in a sewer or drain pipe may be tested by wrapping it with a single layer of white muslin, moistened with a solution of acetate of lead. As the gas escapes through the meshes of the cloth, it will be blackened by the sulphur compound.

A SAFETY MINE ELEVATOR.—An English mining engineer has invented an ingenious device to prevent accidents in the case of the breakage of an elevator rope. In the center of the winding rope is a copper wire which carries a current of electricity to electro-magnets

which hold back grips pulling against springs. The current is broken by the fracture of the rope, the grips are released, and by the action of the springs they come in contact with the guides. The advantage of this method of securing safety over the ordinary mechanical catches is that they do not come into play by the slackening of the rope.

THE BUILDER.

Building Statistics.

Some interesting conclusions are to be drawn from the statistics of building in the principal cities of the United States during the last year, as shown in the records of the building departments for the cities in question. As usual, Philadelphia is far in advance of all other cities in regard to the number of buildings erected, while New York comes second in point of number. The average cost of the Philadelphia buildings in 1890 was, however, but little over \$2000, while the average in New York was nearly \$12,000. Boston came next to New York in the amount of money spent in building, having erected 4400 buildings, at a cost of over \$32,000,000. Curiously enough, Minneapolis erected almost exactly as many buildings as Boston, but at a total cost of about \$2000 apiece. Washington built 4048 houses for \$1500 each; while Cleveland built 4007, at an average cost of less than \$1100, this being the lowest average cost reported anywhere.

As might be expected, the average cost of building in Chicago is now very high, the city standing next to Brooklyn in this respect. New Orleans builds a cheap house, the average cost being about \$1400, but it is to be remembered that the climate of Louisiana is very mild, and that the ordinary house has no cellar, and almost no foundation. The table shows some other curious facts, which are not so easily explained, if, indeed, there is not some error in reporting them. Thus Charleston, S. C., built in 1889 only 225 houses, which cost less than \$295,000. Duluth, in the same time, built 240 houses, which cost very nearly \$2,500,000, or more than \$10,000 apiece. This is the highest average cost reported from any place except New York, but there may be a typographical error in the table. That the Charleston houses should average only \$1300 apiece is natural enough, the climate being nearly as mild as that of New Orleans, but that the number of new buildings and the total cost should be far below that of some obscure Northern villages, such as Waltham, in Massachusetts, which, although it has no building department to keep a record, is said to have built more than 300 houses in 1889, at a cost probably of nearly a million dollars, gives a sad idea of the state of stagnation of the proud South Carolina city. Savannah, the rival of Charleston, made no report at all, and we have no statistics from the newer southern towns, such as Atlanta, Birmingham, Asheville, Chattanooga, St. Augustine or the other places which are just now most talked about.—*American Architect*.

ADVANTAGES OF LOW CEILINGS.—"Rooms with low ceilings, or with ceilings even with the window tops," says the *Popular Science Monthly*, "are more readily and completely ventilated than those with high ceilings. The leakage of air, which is always going on, keeps all parts of the air in motion in such rooms, whereas if the ceiling is higher, only the lower part of the air is moved, and an inverted lake of foul and hot air is left floating in the space above the window tops. To have the currents of fresh air circulating only in the lower parts of the room, while the upper portion of the air is left unaffected, is really the worst way of ventilating, for the stagnant atmospheric lake under the ceiling, although motionless, keeps actively at work, under the law of the diffusion of gases, fouling the fresh currents circulating beneath it. With low ceilings and high windows, no such accumulation of air is possible, for the whole height of the room is swept by the currents, as the dust of the floor is swept by the broom. Low ceilings have also the advantage of enabling the rooms to be warmed with less expenditure of heat and less cost of fuel. The above does not agree with the generally accepted idea of the height of rooms in dwellings, but the authority is good and well worthy of consideration by persons about to build."

NEW BUILDING MATERIALS.—A patent has been granted for a process of manufacturing boards, slabs or plates, chiefly applicable to the usual building purposes of wall and ceiling lining or covering and also as a lining for ice-berths, floors and the like. Each board or plate is composed of the following materials: A large number of small tubes, either especially made of paper or other suitable material or formed of vegetable stalks. These tubes are uniformly distributed, so as to form a number of cores for the semi-liquid mass which is subsequently cast in. A plastic mass consisting of plastic mineral matter, such as burned gypsum, cement or lime, and finely divided particles of organic origin, such as small oaks, wool, hair or feathers, with or without the addition of a liquid binding substance, such as glue, water or a mixture of water with alum, green vitriol and soluble glass in the following relative quantities: Gypsum, cement or lime, 50 parts; small oaks, 10 parts; wool, hair or feathers, 1 part; binding substance, consisting of alum, vitriol and soluble glass, 1 part.

ELECTRICITY.

Electric Roads in and About San Francisco.

The remarkable success which has attended the operating of the cable roads in this city, the city of their birth, has had much to do in keeping in the background roads operated by electricity, but it appears that we are now just upon the eve of a revolution in this regard. The success of the Oakland & Berkeley electric road, and the demonstrated value of the electric system of operating street roads in Eastern cities, has determined some of our San Francisco capitalists to adopt the electric system in this city.

The San Mateo electric road will be the first to go into operation on this side of the bay. The first section of that road, with the outside cemerlees as its temporary terminus, is nearly completed. The contracts for the power house have been let, and work will be commenced in a few days. The house will cost \$31,000, and the concrete bed on which the engine will rest \$8000. The Ralston Iron Works will put in the machinery, and a large force will be put on at once. It is thought that the entire plant will be completed within 60 days.

The North Beach & Mission road, it is expected, will soon wake from its Rip Van Winkle sleep and take on a current of electricity to place itself in the van of our city roads. A meeting will be held on Sept. 23d to consider the matter definitely. Our enterprising citizen, Geo. W. McNear, has recently bought an extensive block of this stock, and freely expressed his ardent desire for the new departure. Horace, however, will probably be continued on the branch from California street to North Beach.

Col. Fred Crocker, who ought to know something of the economic value of the cable system, says he hopes soon to see a second electric road to Berkeley running out on Broadway, Telegraph and Humboldt avenues.

In addition to the above, franchises have been granted in Oakland for electric roads, as follows:

- One from Washington street down 12th to 16th street station.
- One from Oakland to Haywards direct.
- One to pass along 17th street from Broadway to 16th street station.
- One along 8th street from East Oakland to Broadway, Oakland, and along 8th to 16th streets.
- One from Broadway over 8th street bridge to 6th avenue, East Oakland.

The electric road has evidently come to California to stay.

Electricity in Mining.

Few, if any progressive mine operators, says *Engineering News*, now doubt the adaptability of electricity to all manner of mining operations, or the facility with which it can be led into intricate underground workings, as compared with any system of piling. The one doubtful, and a most important point is whether or not it can be used with safety under the conditions present in an average coal mine operated by men unskilled in the use of electricity. The Messrs. Atkinson think all danger can be avoided, and back their statement by an experience of four years with this particular class of machinery. Though Sir John Cook, president of the Institute of Civil Engineers, in a paper read before that body, hoped that the question of the safety of electric power in coal mines, as compared with other methods of conveying power, should occupy a prominent part in the discussion of his paper, no one speaker, in the very voluminous discussion that followed, denied that, with a motor protected and reasonable precautions taken in ventilation, there was little or no danger to be apprehended from the use of electricity.

The bulk of the discussion turned on the relative economy of electricity vs. compressed air rather than upon the question of their relative safety. As far as this discussion treated of the subject, electricity seemed to have the heat of the argument on the score of economy in power and less loss in transmission. But it is also evident that the introduction of the new power into the market was having the effect of making manufacturers of compressing machinery study more closely the working of their own machines.

There is no doubt that air-compressors can be still further improved, great as has been the progress in late years. In the Popp experiments in Paris, the absence of perfect cooling of the compressed air resulted in a loss of 40 per cent of the gross power, and Mr. Howard D. Pearsall claimed that if he could eliminate this loss, all other losses would amount to only 33 per cent, leaving 67 per cent net efficiency. Again, for use in motors, there is great advantage in heating and expanding the air before it enters the cylinder; and while this has been done by Mr. Frederick Hurd in a mine motor, and by Mr. Mekarak in his tramway engine, both systems can be and doubtless will be improved upon and made more valuable commercially. In fact, in mining operations, as in other fields, the electric motor is there to stay, and the appearance of this new power will have the usual stimulating effect upon any rival power that has hitherto held the field undisputed, and we may expect advance in old methods to meet the new conditions.



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SAN FRANCISCO:

Saturday, August 29, 1891.

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Business Announcements.

[NEW THIS ISSUE.]

Roper's Books on Steam Engineering—Osborn & Alexander Edwards' Books on Steam Engineering—Henry Carey Baird & Co., Philadelphia.
Michigan Mining School—Houghton, Michigan.
Well Supplies—The American Well Works, Aurora, Ill.
Assessment Notice—Inyo Marble Company

See Advertising Columns.

Passing Events.

The new mines near Carson, Nev., and near Ogden, Utah, are attracting many prospectors to those regions. In both cases, the indications appear to be pretty good and point to permanent camps.

The famous Allison Ranch mine, on Wolf creek, south of Grass Valley, Nevada Co., has at last been bonded in the sum of \$70,000. This mine was discovered in 1851 and worked until 1867. It was very rich, but a hard mine to work, being very wet. The wonder is the mine has been left idle so long, in view of the great quantity of gold it turned out in its palmy days. From the small vein, over \$2,300,000 was taken out.

An important meeting of employers was held this week to perfect an organization to promote the manufacturing interests of the Pacific Coast by resisting unjust demands of trades unions. The leading firms in almost every branch of industry have joined the association.

In another column is a statement of the establishment of a central electrical power station for mining purposes, designed to furnish power to a number of mines in a district. This is an important move, and one which will doubtless be followed on other parts of the coast.

Gold in Australian Colonies.

Last year Queensland yielded 600,000 ounces of gold; Victoria, 588,560 ounces; New Zealand, 193,193; New South Wales, 137,480; West Australia, 22,806; Tasmania, 20,510; and South Australia, 15,000 ounces. The report of the Mines Department of Victoria shows a falling off in that colony of over 26,277 ounces. The Victorian product of gold for 1890 was 588,560 ounces, or 26,277 ounces less than 1889. The decrease is chiefly due to the falling off in alluvial yields, which amounted to 206,159 ounces, while 382,401 ounces came from quartz. Beechworth and Ararat are the only districts of the seven mining divisions that show an increased yield. Since the commencement of mining to the end of 1890, Victoria has put out 56,870,574 ounces, valued at £227,482,296. The Madame Berry mine still holds first place with a yield of 31,293 ounces for the year, the Berry Consols coming next with 22,302 ounces. The dividends amounted to £504,476, or £22,273 less than 1889. At the end of the year 23,712 men were employed gold mining, 335 less than in the previous year. There were 3164 Chinese at work. Other minerals employed 597 men.

The report indicates that the obtaining of gold in large quantities is daily becoming more difficult. The alluvial deposits of moderate depth have been pretty well worked out, as in California, but there are still large tracts where deep leads may be found. The Secretary for Mines advocates the use of diamond drills and expects to find these deep deposits. He suggests, also, that private enterprises should be aided by the Government in the search for deep leads.

A Mining Electric-Power Station in California.

In last week's PRESS, reference was made to a central electric-power station for mining purposes in Australia, by which power is to be furnished to the various mines and mills of two districts. There is in California a station owned by the American River Syndicate, at the mouth of Rock creek, on the South Fork of the American river, El Dorado county. This has been in operation for more than a year, furnishing electric power for the Dalmatia mine, some miles away from the station. In previous numbers of the PRESS, this plant has been described in some detail, and it has been successful from the start.

In calling this week at the shops of the Electrical Engineering Co. of San Francisco, we learned that this company is about to add to the same circuit a 25-horse power Keith motor for the mill of the St. Lawrence mine, over three miles farther away than the Dalmatia mine.

Mr. Pearson, the superintendent of the syndicate, has secured a large water right at the station, and will furnish electric power to the mines within a circle of several miles radius.

This is the same plan as that proposed in Australia, but the El Dorado county plant has been in operation over a year for one mine; now, with increased machinery, power will be furnished from this central station to a number of mines. Doubtless this system will be applied in other places. Mr. Pearson always had the greatest faith in the plan of applying electric power to mining purposes, and it must be gratifying to him to find that its success demands an extension of facilities to other properties.

Good Roads.

We publish on other pages the concluding portion of Mrs. Hoffman's excellent article on "Country Roads and City Streets," which should be read by all interested in this important subject. In this State, the country roads are usually sadly deficient, being muddy in winter and dusty in summer. During the long dry season, the roads get badly out of shape unless occasionally watered, and there are comparatively few sections where this is done. More attention, however, is now being paid to the roads, as there is a better realization of the importance of good ones.

In our cities, where the noisy, rough and unclean cobble-stone pavement has held sway so long, smoother and better roadways are desired and are being put in. We have in this State an advantage over many others, as there

are such extensive deposits of bituminous rock and asphalt. The finest streets are now paved with this material, not only in this and neighboring cities, but in many of the smaller towns of the interior. More attention is being paid to suitable foundation than formerly, and the result is more durable pavements.

Recent Mineral Discoveries.

Both Utah and Nevada are rejoicing in new mineral fields which are attracting the attention of prospectors. The Pine Nut mines, Silver Lake district, Douglas county, Nev., has one rich mine—the Bank of California—and a number of unopened prospects. The country is said to be showing up many new ledges, some of low grade, but all pretty well defined. Wm. Zinn, the mysterious owner of the first discovery, finally permitted others to go into his claim last Saturday, and visitors report it is all he claimed. He is said to have taken out \$1500 in four hours from the decomposed gold quartz. A claim owned by W. H. Stone and Archibald Baker is also said to show up well. Men are still going into the new camp.

The Utah discovery, briefly mentioned last week, is at Bear Gulch, 25 miles northeast of Ogden. The ore runs high in lead, with 12 to 24 ounces of silver per ton. Bear Gulch, which was the original name of the location, is about three-fourths of a mile wide and 13 miles in extent. Mineral has, however, been discovered in all the section around, and in every instance in paying quantities. The whole country for miles shows vast quantities of low-grade galena ore.

Thus far, mineral has been discovered in a scope of country that covers an area of about two to three miles in width. The richest of the mines yet discovered are the Sundown and Sunrise. The lode is galena, and runs through a hill for a distance of over 6000 feet, and along its entire length blossoms of the great vein can be seen. A two-thirds interest in the Sundown mine has been bonded for \$15,000 by Charles S. Warner of Butte (Mont.). The mine was first discovered by a shepherd, and was opened by Pete Wilson and Abe Bolton of Brigham City.

The famous Bullion Block Mining Co. has about 50 men at work on the La Plata mine, from which it is taking out large quantities. The ore is galena.

A town called La Plata has been laid out, and some 1200 people are said to have already gathered in the region, and many more are on the way. There are all sorts of stories, more or less exaggerated, regarding the richness of the ledges. Many persons believe this to be in the same ore belt as Park City, where there are many rich mines. The new district is thought to be one of great extent and permanency.

Recent Applications of Electricity.

Although there are a number of treatises on the subject of electricity, there is a demand for more information, relating especially to the practical part of the science, and this demand is particularly among amateurs and students who want a simple work on the subject. Such a work has just been published by the Buhner Publishing Co., Lynn, Mass. It is called "Electricity and its Recent Applications," by Edward Trevert, author of several other works on electricity. The work is presented on an excellent plan, and is characterized by intelligent treatment; the principles and methods being plainly demonstrated. The book is written up to date and expounds all the latest problems. The author devotes himself with special earnestness to a thorough investigation of all the latest developments, and the language is so simple and expressive that the subjects are brought within the comprehension of all. It is a valuable textbook for beginners in the practical application of electricity in its varied forms to diversified arts and industries. Among other chapters are those on the modern electric railway, electrical mining apparatus, electric welding, electric lighting, motors, dynamos, incandescent lamps, etc. The book has about 350 pages, is well illustrated, and costs \$2. The agents in this city are Osborn & Alexander, 401 Market St. For those who want a simple, readable work on this subject, without mathematical formulae, this is the best we have seen.

Important to Advertisers.

In conversation recently with two different advertising patrons of the MINING AND SCIENTIFIC PRESS, they each (very positively) assured the editor that they received better returns from their advertisements in this paper than from any in which their business notices were inserted. One of these gentlemen advertises an article adapted for the use of steam-users and manufacturers, and the other wants the attention of the mining community. They found that they reached these special classes better through the columns of the MINING AND SCIENTIFIC PRESS than through any other medium. Both of them, moreover, have their advertisements inserted in several papers in this and other Pacific Coast States, but the letters received by them indicated that most of their correspondents had seen the cards in this paper.

In this connection, it may be remarked that the expenses incident to the publication of an illustrated technical paper such as the MINING AND SCIENTIFIC PRESS are much greater than those of ordinary newspapers, and that it is the advertising patronage from which a large share of income is derived, enabling the publishers to furnish first-class literature to their subscribers. Every advertiser in a journal such as this, through his patronage not only brings his goods to the attention of special classes, but assists largely in maintaining the publication to the proper standard.

It is of advantage to them and to the publishers of the paper when those who send inquiries or orders mention the fact that the advertisement was seen in the MINING AND SCIENTIFIC PRESS. In order to reach the special class of readers who are subscribers of this journal, the advertisers give us their patronage, and it is gratifying to know that the PRESS is giving the best results.

California and Oregon Coal.

Census investigations reveal a somewhat unpleasant fact in connection with the coal product of the States of California and Oregon, these two and Michigan being the only States of the Union which show a decrease in production of coal in the past ten years. This fact is still more marked when it is known that the coal production of the whole country has almost doubled in the last decade.

The combined coal product of California and Oregon was 280,155 short tons in 1880, while in 1890 it was only 186,179 tons—a decrease of 93,976 tons. There are only 10 collieries in these two States, employing 443 men. These collieries are only those which ship their product to market by rail or water, the small mines worked for local sales not being included.

The State of Washington has a very different story in the census. The production in 1880 was 145,015 short tons, and in 1890, it was 993,724 tons, an increase of 848,709 tons, the increase alone being about four times the total product of California and Oregon. Washington has 12 collieries in which 1847 men are employed.

Coal is now mined in 29 of the 44 States of the Union. There are 2539 collieries, employing 296,974 men. Taking the ordinary ratio, this shows that about 1,200,000 people are directly dependent on the working of coal mines in this country. The total product of the collieries of this country, in the census year, was 140,747,591 tons, an increase over the previous census year (1880) of 64,411,009 tons.

On this coast there are still large coal fields undeveloped, but the coal is of a comparatively inferior quality. Better coal comes here from Washington and from abroad than is found in California or Oregon, most of ours being lignite or of a character which breaks up on shipment and does not market well except for steam coal.

A COMPANY called the Monarch Cons., has been organized at Pine Nut, Nev., with \$1,000,000 capital stock. This is one of the new mines in Silver Lake district, Pine Nut, Douglas Co., Nev. The trustees are T. E. Roper, A. M. Ardens, Wm. Woodburn, James A. Raycraft and J. R. Judge.

JOHN ZARO, a miner, after blasting Saturday in the Hector gold mine, Sutter creek, Amador Co., was working the loose rock out with a crowbar when a piece above him fell, striking him on the head, killing him instantly. The deceased was 23 years old and a native of Austria.

Wood's Water-Tube Boiler.

The boiler illustrated on page 129 is a radical departure from the ordinary type of tubular boiler, and has several decided improvements. The boiler is constructed, as will be seen by an inspection of the cut, of two end tube cylinders, varying in diameter according to the power of the boiler required, but in no case to exceed three feet long, which leaves ample room for a man to work in, and with all the facilities provided in an ordinary cylinder boiler. The end plates of the cylinders are flanged and single riveted. The outer end plates are dished, that is, made convex, to give them additional strength, the inner plates being stayed by the tubes. In the centre, and on the outside plate of each cylinder, a manhole—as shown—is provided; which permits easy access to all the tubes, for the purpose of cleaning or repairs.

The inner or tube plate consists of a circular flanged plate, five-eighths of an inch in thickness, in which there are a number of holes drilled in a staggered form. The back cylinder and tube end is an exact duplicate of the front, and the two are connected together by a number of 4 to 4½ inch tubes. These are all expanded and beaded over on the inside of each tube-head. At certain spaces there are 1½ inch stay rods passing through the tubes and riveted to the outer or dished head by means of wrought-iron crow-foot ends. These act as braces or stays, while each tube acts in the same capacity, and each tube being of greater strength than the stay rods, although the pressure on the tube sheets almost equalizes the pressure on the outside or dished ends. Hence it will be seen there is an additional amount of strength over any pressure desirable to carry. The shells of these tube cylinders are made of best plates full three-eighths of an inch thick and double riveted, and each connected on the top to a steam drum of sufficient size by a 16-inch neck, double riveted at their flanges and made of best plates, even-sixteenths of an inch thick. These necks are capable of allowing a perfect and constant circulation. The drum being 30 to 36 inches in diameter, and about two feet longer than the boiler, ample storage-room for water and steam is provided. The drum also being accessible at the front end by means of a man-hole, allows every part to be explored. The boiler is supported either by side brackets riveted to the shell of the tube cylinders or is suspended from the top by means of side columns and girders, or saddles, to yokes riveted to the top of the steam drum directly under the saddle, and thus is entirely free from the brickwork.

In this boiler the cleaning can be done in a few minutes. In other boilers of this type a large number of small caps or plugs have to be removed, thus losing time and causing much annoyance and expense, and often it is found impossible to remove them. The ready access to the tubes afforded by the man-holes insures their full heating surface being always kept available, and there is no loss from the effects of dirt, etc.

Should any repairs need to be done in this boiler, they can be accomplished by any boiler maker or mechanic with the same facility as with an ordinary cylinder boiler. Mr. Wood claims to be able to replace any of the tubes in a much shorter space of time than is required in other tubular boilers.

The boiler is economical in the use of fuel, and if properly fired it should evaporate 11 or 12 pounds of water to one pound of coal. The water being contained in the tubes or tube cylinder, divides it up into many small parts and is consequently subjected to greatest heat of the furnace, so that steam can be raised rapidly in any emergency. The circulation being so perfect, prevents, to a great extent, the accumulation of scale and other deposits over the fire. Being made in a sectional form, a maximum of safety is established. In case one part should rupture, an immediate relief is given to the boiler, thus preventing disastrous explosions. Rix & Birrell, 33-40 Fremont St., this city, are the local agents for this improved steam generator.

COLORADO, known to the world as a great silver producing State, is getting ready to make a great exhibit of gold ores at Chicago.

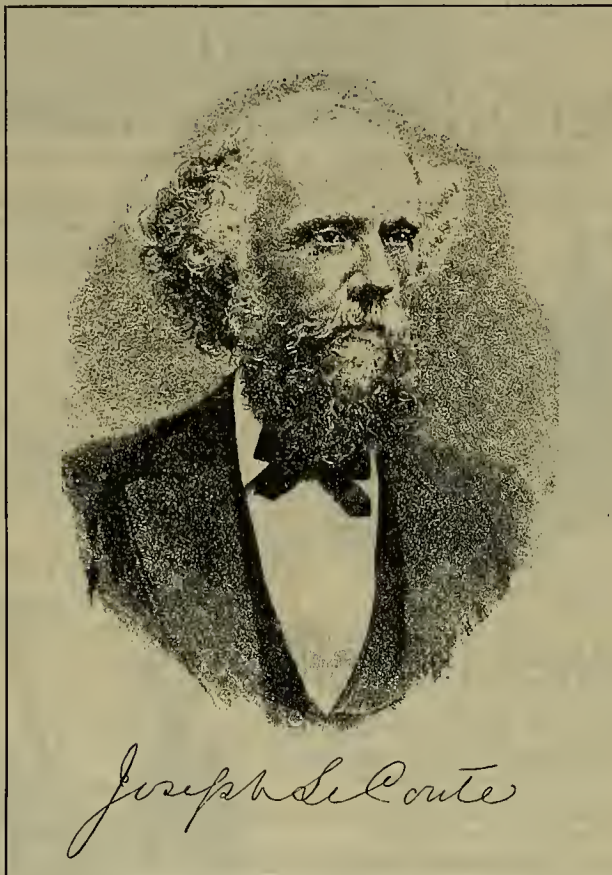
THE Wellington Collieries, B. C., are reported sold by the Dunsmuirs to an English syndicate, the price named being \$2,500,000.

The New President of the American Association.

Joseph Le Conte, Professor of Geology and Natural History in the University of California, has been elected President of the American Association for the Advancement of Science. This is a decided honor to California, as this association stands at the head of all the scientific societies in the United States, and mere membership is a distinction. When such an association elects a man for its president, it not only does honor to the individual, but to the State in which he resides.

In this case, the compliment is a highly deserved one, as Prof. Le Conte has a standing in the scientific world equal to any man in the country.

Prof. Le Conte was born in Liberty county, Ga., in 1823. He entered Franklin College in 1838, and was graduated in 1841, taking the degree of A. B., receiving the degree of A. M.



four years later from the same institution. In 1845, he was graduated from the College of Physicians and Surgeons in New York City. He practiced medicine in Macon, Ga., until in 1850 he removed to Cambridge, Mass., to complete, under Agassiz, a course of studies, long since commenced, in natural history and geology. Dr. Le Conte remained with Agassiz 18 months, accompanying him in 1851 to the reefs of Florida, which resulted in important discoveries concerning the recency and coral origin of those regions.

After taking the degree of B. S. at the Lawrence Scientific school, Cambridge, he returned to Georgia and was appointed to the chair of natural sciences in Oglethorpe University. He resigned this position after one year to accept the chair of natural history and geology in the University of Georgia, which position he held for four years. In 1857 he was elected to the chair of chemistry and geology in the University of South Carolina. In 1869 he accepted the Professorship of geology and natural history in the University of California, the position he so ably fills at the present time.

Prof. Le Conte has been a frequent contributor to the periodical literature of the country, both literary and scientific. In 1873 he published a volume entitled "Religion and Science," a series of Sunday lectures. He gave to the world his "Elements of Geology" in 1878, and in 1881 published his "Sight, an Exposition of the Principles of Monocular and Binocular Vision," a work which has been accepted as a standard. Prof. Le Conte is a member of all the more important scientific associations of the Union. He is a very pop-

ular man with the students and all who know him. Like most men of great attainments, he is modest and retiring in disposition. Those connected with all branches of science in California will rejoice that the honor of the Presidency of the American Association has fallen to Prof. Le Conte.

Government Jetties at Eureka.

It seems to have been fairly estimated that 20,000 people and a corresponding amount of freight pass over the bar at the mouth of Humboldt bay yearly. All these have been in more or less jeopardy. Mr. Frank S. Chapin writes us that now the Government has driven rows of piles out from each side, laid a temporary railroad track upon them, fitted up a scow to run rock across the bay, and a derrick to elevate the cars of rock upon the track that runs out on the piles. They hauled rock down on the Mad River R. R., ran the cars upon the scow,

and tow them across the bay; run them out on the track, and by tonobing a trigger, dump the load from both sides at once upon a heavy matinee.

They now report 30 feet of water on the bar. It is expected that this will be permanent, and will make Eureka a harbor as safe as it is important. It portends a new era of prosperity when they can build, launch and load first-class vessels.

This is only one of the pieces of engineering work that the Government is engaged in on this coast, improving the harbors. The jetties at San Pedro, the port for Los Angeles, are quite extensive. Those at Oakland harbor are, however, the most complete on this coast, and form the entrance to the harbor proper. Before these jetties were built, and the waters confined in a narrow channel, only light draft vessels could go to the city wharves. Now large vessels may enter, and the current, being confined in a definite channel, maintains the depth gained by dredging, there being no further shoaling. The bar at Humboldt bay, where they are building the jetties, is a very bad one, and its condition has been detrimental to the interests of an important region. With a permanent depth of 30 feet on the bar, its dangers will be practically done away with.

It is stated that the electric motor has now found employment in connection with nearly 300 branches of productive industry.

An important discovery of mica has been made near the mouth of the Porlinga river, South Westland, New Zealand.

Employers and Manufacturers Organize.

A protective organization of employers was formed in this city this week to take united stand against any possible unjust demands of labor unions. The association is to be known as the Board of Manufacturers and Employers of California. The following declaration of principles was adopted after brief discussion:

This association is formed to promote the manufacturing interest of the Pacific Coast. Its policy is not dictated by a spirit of aggression, but it shall be the earnest endeavors of its members to prevent friction and to peacefully settle all disputes that may arise between employer and employed.

We, the members of the association, have no wish to interfere with the indisputable right of labor to organize, and believe that the organization and federation of labor compel the organization and federation of employers of labor, to the end that neither party shall tempt the other to overstep the bounds of right, reason and justice.

We believe that arbitrary spirit shown by the unions in the absence of any effective restraining power, and the frequent strikes and boycotts, which have in consequence prevailed in this community, are dangerous to its industries, and this association of employers is formed to check these growing evils.

We recognize the right of labor to organize in its own defense, and to ameliorate its condition, and we, as employers, will not trespass on that right by refusing employment to any one because belonging to such labor organization, but we reserve to ourselves the right to decide whom we shall or whom we shall not employ.

The Constitution, which was also adopted, provides that the association shall be composed of firms, corporations and individual employers of this State, approved by the Board of Directors after October 1st. No member shall be permitted to withdraw without having given 60 days notice. The monthly dues shall be \$2.50, and the association shall meet whenever called by the Directors.

Concerning strikes and boycotts, the Constitution contains the following article:

WHEREAS, Strikes and boycotts are inimical to the best interest of both employer and employee; and whereas, this association is desirous of exhausting all amicable means of ending or preventing strikes or boycotts before resorting to coercion; it is hereby provided,

That in case of a strike or boycott in any of the different trades represented in the association, which cannot be settled by the trade involved in such difficulty, it shall be the duty of the Board of Directors to investigate the trouble, act as an arbitration committee, or recommend such means or take such steps to end the strike or boycott as it may deem advisable or necessary.

A Board of Directors was selected as follows: E. M. Herrick, G. Nickselsburg, Oscar Lewis, Al Rollins, James R. Carriok, W. N. Miller, Albert Darnham, George H. Fuller, J. B. Stetson and Henry Bingham.

DEATH OF A VISCONTESSE.—Last week the funeral of Viscontesse Aletto H. de la Cornillere, widow of the Viscount Charles Marie Earnest de la Cornillere of Pons, France, took place in Oakland. The deceased was born at Cape Town, Africa, about 1840, and married her husband there, where he was a political exile from his native land. He was a man of scholarly attainments and occupied the position of professor of languages in two universities of Cape Town. After the decease of her husband the lady found herself dependent upon her own resources for support. For some time she was employed in this office as was also her daughter. The deceased leaves two children, a son Henry Gaston Earnest de la Cornillere, aged 18, and a daughter, Catherine Olympe de la Cornillere, aged 16. There are no other relatives in this country. The Count de la Cornillere, father of the viscount, died in France about four years ago.

In Victoria, Australia, from 1874 to 1890, an average of one man per week has been killed by mining accidents, the greater percentage being due to falls of earth. Besides this, 116 men per annum have received severe injuries in mines.

PARTIDGE's free magic lantern exhibition is a deservedly popular one in the Mechanics' Fair. The pictures are fairly instructive. His 20 minute lectures and series of exhibits are valuable for the information and rest afforded at the same time in viewing them.

THE returns from eight gold-dredging and sluicing companies in Otago, N. Z., one week in last month were 367 ounces of gold. We have not been successful in river dredging for gold in this country.

MRS. GERTIE DE FORCE CLUFF, of Lodi, is the patentee of garment fastener that is attracting attention at the Mechanics' Fair.

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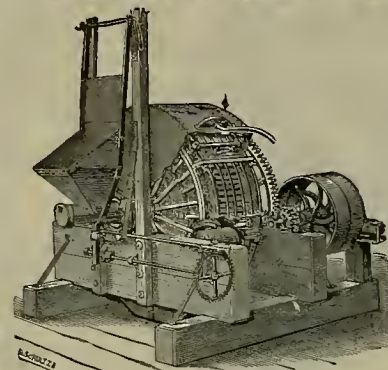
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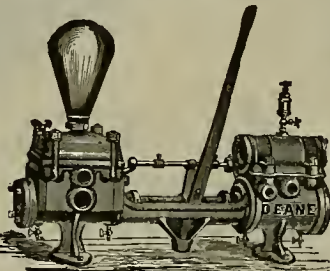
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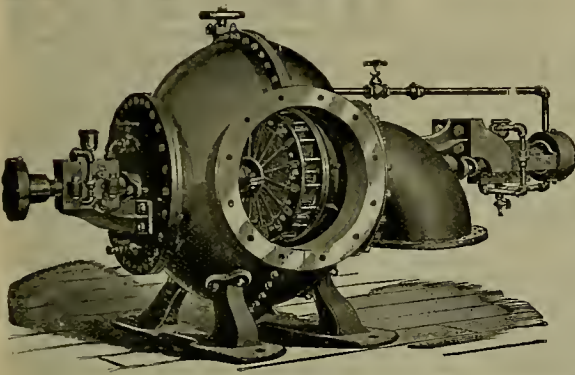
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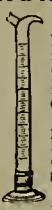
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COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ'T AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co., Nevada.	42. 50c. Aug 4, Sept 7, Sept 23.	O. L. Perkins.	331 Pine St
Bullion M Co., Nevada.	42. 50c. Aug 4, Sept 7, Sept 23.	R. Grayson.	331 Pine St
Chollar M Co., Nevada.	30. 50c. July 14, Aug 13, Sept 3.	C. E. Elliott.	309 Montgomery St
Challenge Con M Co., Nevada.	9. 50c. July 31, Sept 2, Sept 23.	C. L. McCoy.	331 Pine St
Crown Point M Co., Nevada.	55. 50c. July 9, Aug 13, Sept 3.	J. Newlands.	331 Pine St
Crutcher M Co., California.	2. 50c. July 7, Aug 17, Sept 7.	E. J. Koch.	21 Sansome St
Excelsior M Co., Nevada.	21. 25c. July 21, Aug 27, Sept 17.	C. E. Elliott.	309 Montgomery St
Golden Fleece Gravel M Co., Cal.	15. 45c. June 30, Aug 12, Sept 19.	W. J. Gleason.	Phelan Block
Golden Jacket M Co., Nevada.	4. 3c. July 20, Aug 12, Sept 12.	R. McCallan.	331 Montgomery St
Gould & Curry M Co., Nevada.	67. 30c. July 22, Aug 12, Sept 17.	A. K. Durbin.	309 Montgomery St
Gray Eagle M Co., California.	25. 50c. Aug 12, Sept 14, Oct 5, Oct 23.	G. W. Luce.	137 Montgomery St
Inyo Marble Co., California.	14. 10c. Aug 21, Oct 5, Oct 23.	T. S. Stadfeldt.	309 Montgomery St
Julia Cone M Co., Nevada.	24. 10c. Aug 15, Sept 16, Oct 8.	R. E. Kelley.	419 California St
Justice M Co., Nevada.	48. 25c. July 11, Aug 15, Sept 4.	A. C. Cooper.	325 Montgomery St
Martin White M Co., Nevada.	26. 25c. July 21, Aug 14, Sept 4.	E. Elliott.	309 Montgomery St
Mexican M Co., Nevada.	43. 25c. Aug 17, Sept 14, Oct 14.	L. Leavitt.	533 Kearny St
Monte Christo M Co., Nevada.	5. 25c. Aug 4, Sept 10, Oct 2.	J. W. Pew.	310 Pine St
New El Dorado G M Co., California.	2. 50c. July 21, Aug 25, Sept 15.	C. E. Elliott.	309 Montgomery St
Potosi M Co., Nevada.	36. 50c. Aug 11, Sept 14, Sept 30.	H. Holmes.	309 Montgomery St
Savage M Co., California.	4. 25c. July 20, Aug 23, Sept 21.	H. Fink.	309 Montgomery St
Scott Bar M Co., California.	7. 20c. Aug 18, Sept 29, Oct 27.	J. W. Pew.	310 Pine St
Silver King M Co., Arizona.	2. 8c. June 27, Aug 14, Sept 18.	C. E. Wiggin.	19 O'Farrell St
Smith M Co., California.	6. 10c. July 11, Aug 11, Sept 5.	W. J. Gunnert.	308 Pine St
Tehachan Con M Co., California.	5. 50c. Aug 11, Sept 14, Sept 30.	A. Chantant.	329 Montgomery St
Teressa M Co., Nevada.	7. 50c. July 10, Aug 12, Aug 31.	O. Hermann.	332 Kearney St
Tuloume Co Development Co., Cal.	7. 50c. Aug 25, Oct 1, Oct 22.	A. Waterman.	309 Montgomery St
Weldon M Co., Arizona.	4. 50c. Aug 25, Oct 1, Oct 22.	A. Waterman.	309 Montgomery St

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Inyo Marble Co., California.	G. W. Luce.	132 California St.	Annual.	Sept 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co.	T. Wetzel.	320 Sansome St.	10.	Aug 15
Cons Cal & Virginia M Co., Nevada.	A. W. Havens.	309 Montgomery St.	50.	Aug 17
Idaho M Co., Grass Valley.		Grass Valley.	3.00.	Aug 4
Naylor Gravel M Co., California.	D. M. Kest.	330 Pine St.	50.	Aug 20
North Banner Cons M Co., California.	T. J. Mitchell.	Grass Valley.	50.	Aug 20
North Commonwealth M Co., Nevada.	J. W. Pew.	310 Pine St.	25.	June 17
North Star M Co., California.	D. A. Jennings.	401 California St.	50.	Aug 8
Pacific Coast Borax Co., California.	A. H. Clough.	250 Montgomery St.	1.00.	Aug 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING August 6.	WEEK ENDING August 13.	WEEK ENDING August 20.	WEEK ENDING August 27.
Alpha.	80. 1.00	70. 1.00	75. 80. 70	75
Alta.	65. 75	60. 70	55. 60	55
Andes.	35. 1.10	40. 1.00	45. 1.15	1.20
Belcher.	1.30	1.65	1.40	1.55
Belle Isle.	60.	60.	55.	35. 40
Best & Belcher.	2.75	3.15	3.10	4.05
Bullion.	3.35	4.00	2.85	3.40
Bodie.	30.	30.	25.	30. 60
Buher.	30.	40.	35.	40
Commonwealth.	5.00	5.87	5.62	7.62
Con. Va. & Cal.	1.20	1.30	1.10	1.31
Challenge.	1.20	1.30	1.10	1.31
Chollar.	2.65	3.40	2.80	3.40
Confidence.	3.60	4.00	4.25	4.00
Con. Imperial.	10.	15.	10.	15
Oaledonia.	60.	70.	50.	65
Crown Point.	1.25	1.40	1.25	1.51
Crocker.	20.	20.	15.	20
Del Monte.	20.	20.	15.	20
Eureka Con.	75.	90.	55.	90
Excelsior.	15.	15.	10.	15
Grand Prize.	1.40	1.85	1.45	1.75
Gould & Curry.	1.80	2.15	1.60	2.01
Hale & Norcross.	20.	25.	15.	20
Julia.	50.	65.	40.	65
Justice.	30.	30.	20.	30
Kentuck.	25.	20.	15.	20
Lady Wash.	45.	45.	30.	45
Mono.	2.15	2.50	2.30	2.90
Mexican.	1.15	1.30	1.00	1.15
Navajo.	3.00	3.50	3.20	3.80
North Belle Isle.	50.	55.	40.	55
Nev. Queen.	1.15	1.30	1.00	1.15
Occidental.	3.00	3.50	3.20	3.80
Ophir.	2.25	2.80	2.10	2.85
Overman.	4.60	6.00	4.00	6.75
Potosi.	10.	10.	15.	10
Peerless.	1.20	1.10	1.05.	1.15
Peet.	1.20	1.10	1.05.	1.15
Sage.	1.20	1.10	1.05.	1.15
S. B. & M.	2.80	3.30	2.70	3.45
Sierra Nevada.	2.80	3.30	2.70	3.45
Silver Hill.	20.	25.	15.	20
Scorpion.	30.	40.	35.	40
Union Con.	2.05	2.80	2.45	2.75
Utah.	80.	95.	80.	90
Yellow Jacket.	1.55	1.90	1.55	1.90

Sales at San Francisco Stock Exchange.

THURSDAY, August 27, 9:30 A. M.	THURSDAY, August 27, 1891.
50 Andes.	1.20
200 Belcher.	1.25
100 Best & Belcher.	3.55
250 Bullion.	2.80
100 Challenge Con.	90c
50 Chollar.	2.10
150 Con Cal & Va.	6.52
500 Con Imperial.	10c
100 Crown Point.	1.70
200 Exc equer.	70c

San Francisco Metal and Coal Market.

ANTIMONY.	THURSDAY, August 27, 1891.
Per lb.	13 1/2
Refined, in car lots.	8
Powdered, do.	8
Concentrated, do.	7 1/2
All grades jobbing at advance.	
COPPER.	TINPLATE.
Bolt.	22 @
Sheeting.	22 @
Ingot, jobbing.	22 @
Do, wholesale.	22 @
Fire Box Sheets.	22 @
IRON.	COAL.
Bar, hase.	3 @
Norway.	42 @
Pig Iron.	Spot. Load.
Eglington.	28 @
Glengarnock.	27 @
Am. Safe.	23 @
Oregon.	23 @
Puget Sound.	27 @
Olay Lake White.	23 @
Shots.	25 @
Langdon.	25 @
Thorcliff.	26 @
Gartsherr.	25 @
Barrow.	25 @
Carrollville.	23 @
CHROME IRON ORE.	SCOTCH SPLIT.
Per ton.	10 @
LEAD.	WEST HARTLEY.
Pig.	41 @
Sheet.	74 @
Pipe.	61 @
SHOT.	QUICKSILVER.
(Discount 10% on 500 bags.)	
Drop, 38 bag.	1.90 @
Buck, 38 bag.	2.10 @
Chilled, 38 bag.	2.30 @
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SITUATION WANTED By a man 42 years old, with 7 years experience in gold, silver and opal mining and surveying; graduate of the Mining Academy in Schemnitz, Hungary. References in Hungarian (Magyar) language. Content with moderate salary until he proves his ability. Address FREELAND, P.A., Lock Box 62, G. S.

Eastern Metal Markets.

By Telegraph.

NEW YORK, August 27.—The following are the closing prices the past week:
Silver in Silver in London. New York. Copper. Lead. Tin.
Thursday. 45 5-16 98 12 00 4 60 20 00
Friday. 45 5-16 98 12 00 4 45 19 95
Saturday. 45 5-16 98 12 00 4 45 19 95
Monday. 45 5-16 98 12 15 4 42 20 10
Tuesday. 45 5-16 98 12 25 4 45 20 00
Wednesday. 45 5-16 98 12 25 4 45 20 05
Quicksilver is steady. Borax continues weak. Tin fluctuates. The tone is barely steady. Lead is strongly held. Copper shows more strength.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show this paper to others.

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The Young Engineer's Own Book. Containing an Explanation of the Principles and Theories on which the Steam Engine as a Prime Mover is based. Price. \$3.00

Questions and Answers for Engineers. This little book contains all the questions that Engineers will be asked when undergoing an examination. Price, \$3.00
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Catechism on High Pressure, or Non-Condensing Steam Engines. Price. \$3.00
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Assessment Notices.

NEW EL DORADO GOLD MINING COMPANY.

Location of principal place of business, San Francisco, California. Location of works, El Dorado County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of August, 1891, an assessment, No. 2, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of September, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 2d day of October, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Lo

cation of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of August, 1891, an assessment, No. 25, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of September, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 6th day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

INYO MARBLE COMPANY.—LOCATION

of principal place of business, San Francisco, California. Location of works, Inyo County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of August, 1891, an assessment, (No. 14) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 137 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 5th day of October, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 23d day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
G. W. LUCE, Secretary.
Office, 137 Montgomery Street, San Francisco, California.

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SEND FOR CIRCULAR. E. P. HEALD, President.

C. S. HALEY, Secretary.

ANNUAL MEETING.—THE REGULAR

Annual Meeting of the Stockholders of the Inyo Marble Company will be held at the office of the Company, No. 137 Montgomery Street, San Francisco, California, on THURSDAY, the 26th day of September, 1891, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books close on Monday, September 7th, at 2 o'clock P. M. G. W. LUCE, Secretary, Office, G. W. Luce, Secretary, No. 132 California Street, San Francisco, California.

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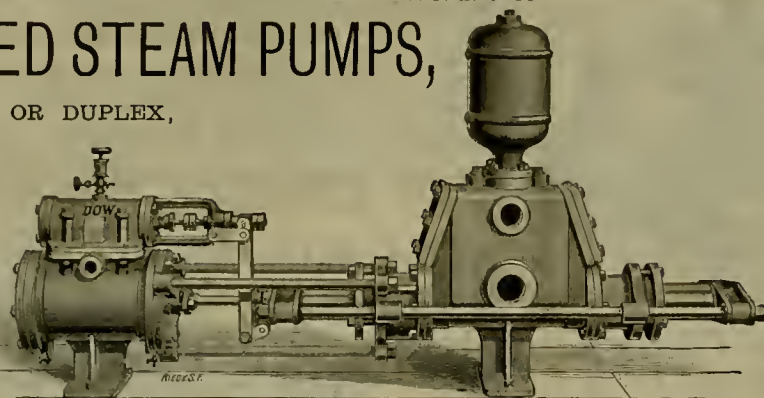
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POWER PUMPING MACHINERY,

SPEED GOVERNORS,

Balance Valves and Pressure
Regulators,

FOR STEAM PUMPS, ETC., ETC

CORRESPONDENCE SOLICITED.

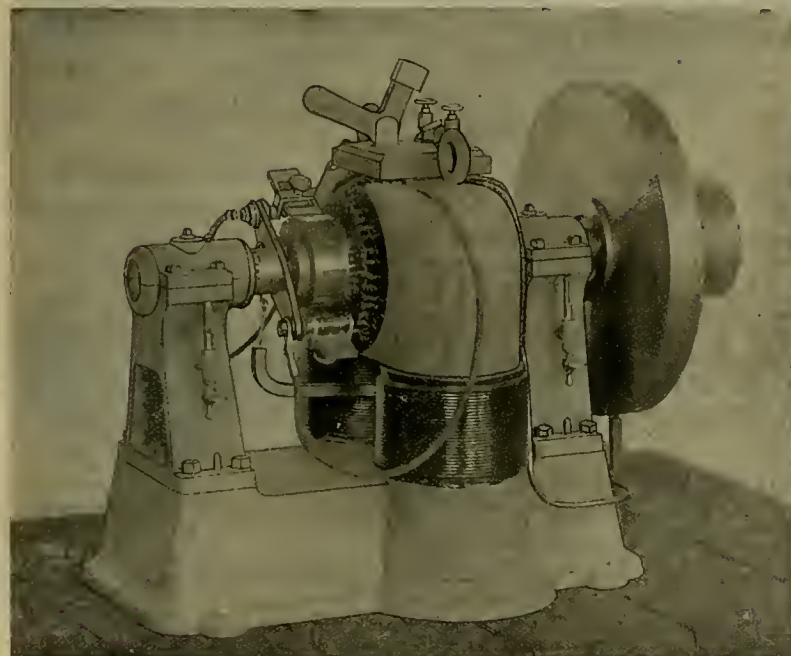
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FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.



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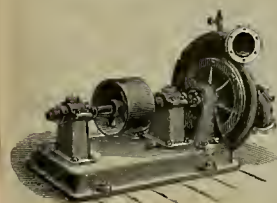
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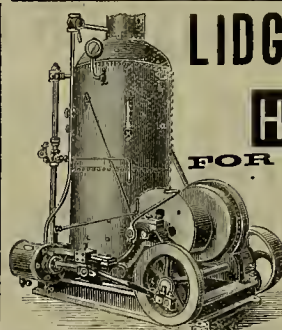
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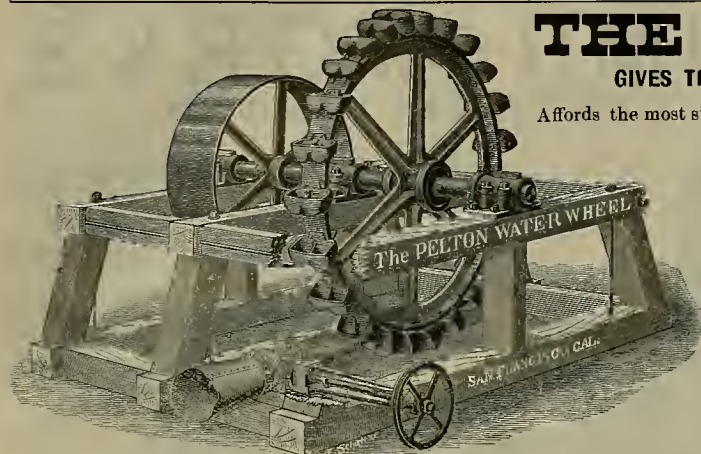
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IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER AT REDUCED PRICES.

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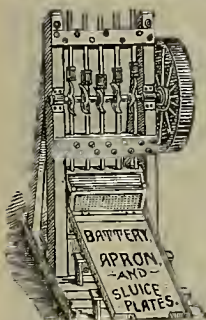
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PRICES GREATLY REDUCED. ONLY REFINED SILVER AND BEST COPPER USED. OVER 3000 ORDERS FILLED. FIFTEEN MEDALS AWARDED. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated. These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Streets, San Francisco.

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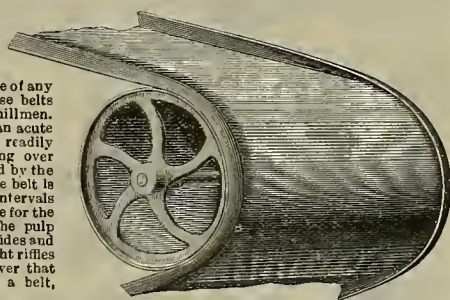


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We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight rifles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.

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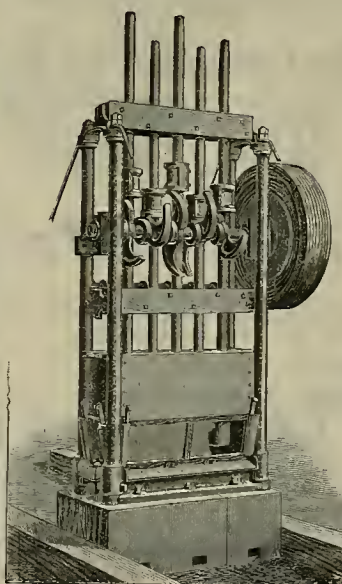
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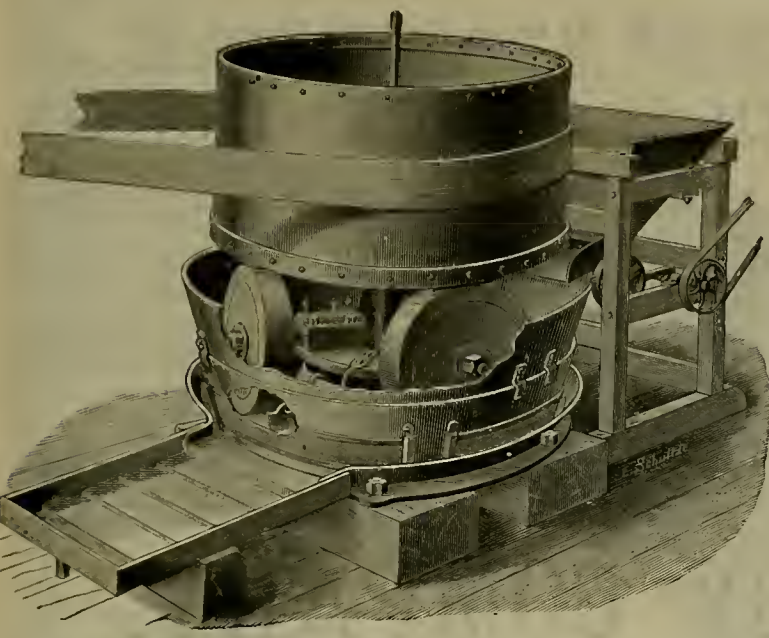
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WE HAVE ON HAND AND FOR SALE CHEAP

A 50 H. P. PUMPING PLANT, CONSISTING OF

One 10" x 30" Corliss Engine; all pump gears; bob irons; connecting rods.

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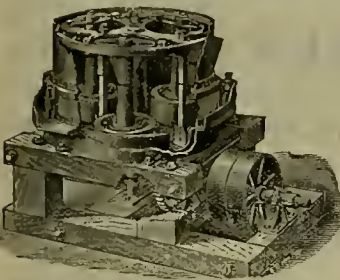
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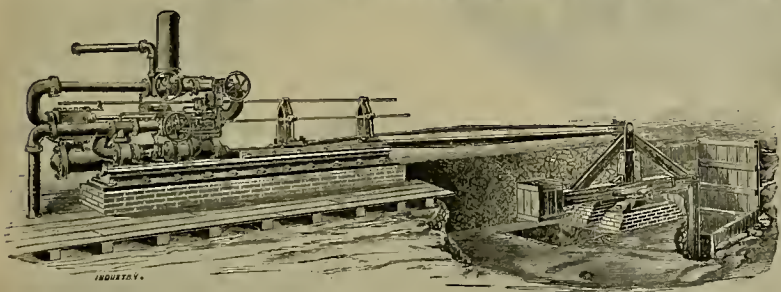
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IT HAS NO EQUAL. POSITIVELY FIRE-PROOF.

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For BOILERS, STEAM PIPES, COLD STORAGE, and all places requiring Non-Heat-Conducting Material.

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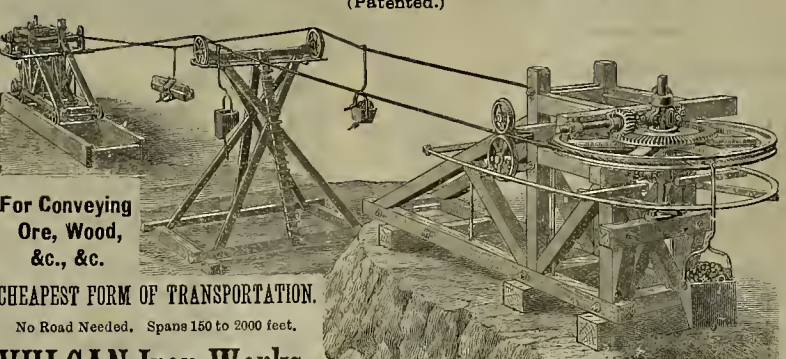


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CHEAPEST FORM OF TRANSPORTATION.

No Road Needed. Spans 150 to 2000 feet.

VULCAN Iron Works, 135-145 Fremont Street, San Francisco, Cal.

Adamantine Shoes and Dies

—AND—

CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

THESE CASTINGS ARE EXTENSIVELY USED IN ALL THE MINING STATES and Territories of North and South America. Guaranteed to prove better and cheaper than any other. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

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Special attention given to the purchase of Mine and Mill Supplies.



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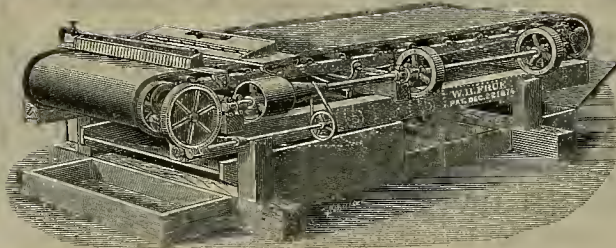
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of this ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our offices.



PROTECTED BY PATENTS—September 2, 1879,
April 27, 1880; March 22, 1881; February 20,
1883; September 18, 1883; July 24, 1888.
Patents applied for.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

ADAMS & CARLISLE FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

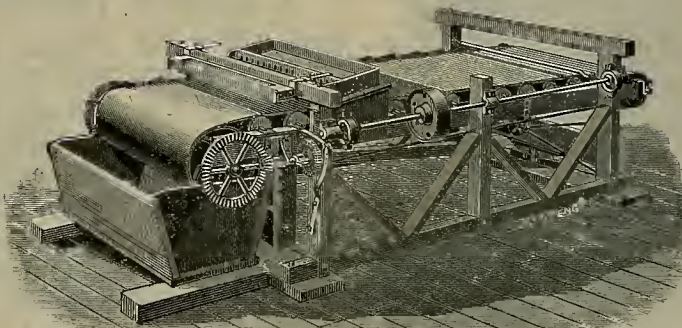
TULLOCK IMPROVED ORE CONCENTRATOR.

Patented Oct. 9, 1888, and Dec., 1890.

ANGELS, CALAVERAS COUNTY, Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir, I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON GARRARD,
Supt. Gold Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6, 1890.

MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.



ANGELS, CALAVERAS CO., Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours,
T. M. LANE, Supt. Madison Mine.

ANGELS CAMP, July 25, 1891.
MR. JAMES TULLOCK—Dear Sir: We are working sulphurets from mines in Calaveras and Tuolumne Co's. We find the sulphurets saved on your machines cleaner than those saved on any other. Yours truly,
THOS. N. SMITH, Supt. Ulica Chlorination Works.

Price, \$450.

For further particulars, address JAMES TULLOCK, Angels, Cal., or

Risdon Iron and Locomotive Works,
Cor. Beale and Howard Sts., San Francisco.

PARKE & LACY COMPANY,

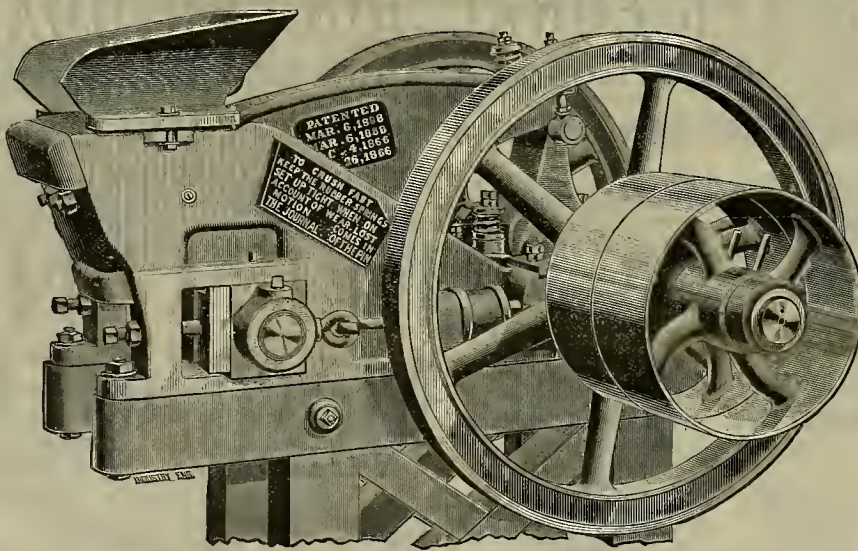
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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 10.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 5, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

The McIntosh & Seymour Engines.

Engravings on this page represent the McIntosh & Seymour standard single cylinder and standard compound engines. The single cylinder belongs to a type of engines which has become very familiar in recent years and which possesses the advantages of simplicity, concentration of a large amount of power in a very small space, high rotative speed and a closeness of regulation much superior to that of any other class. They are entirely self-contained. Their economy in consumption of steam is good as compared with single cylinder engines of the same size of other types and their cost is moderate. These qualities are peculiarly valuable in an engine for electrical purposes and the immense growth of this industry is responsible for the evolution and large use of this style of engine, although they are well adapted for general manufacturing purposes.

The general design of the engine, as is shown by the cuts, presents no radically novel features except in two vital points, the valve and governor. All other parts are well-known forms, which, by reason of their thoroughly proven reliability and durability, their simplicity and the ease with which they can be kept in proper adjustment, have come to be recognized, in the best engineering practice as standard. They are so arranged as to be easily accessible. All wearing surfaces are large, adjustable for taking up wear, are made of the most suitable materials, and have provisions for thorough lubrication while running, by sight-feed devices. All parts of the governor and the valve seats, as well as the running parts generally, are carefully and intelligently scraped to insure accuracy and proper bearing surface. In doing this, surface and angle plates are used where possible, the valves are ground and shaft is ground and lapped, so as to be per-

fectly true. All finished parts are highly polished. A complete equipment of standard gages and jigs enables the engines to be made strictly interchangeable, so that all parts can be easily duplicated.

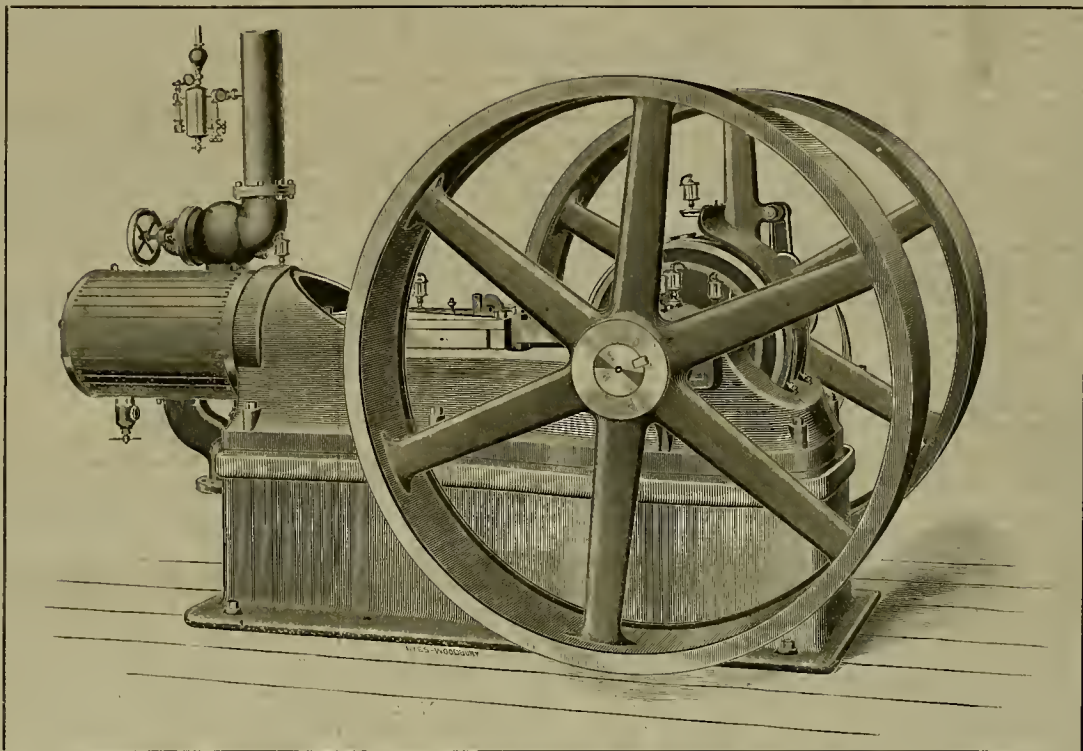
The engines are designed throughout with a

liberal reserve strength for emergencies, and the utmost care has been bestowed upon all details, in order to avoid points liable to derangement or excessive wear which may cause annoyance or render repairs necessary. Each engine is subjected to a thorough test.

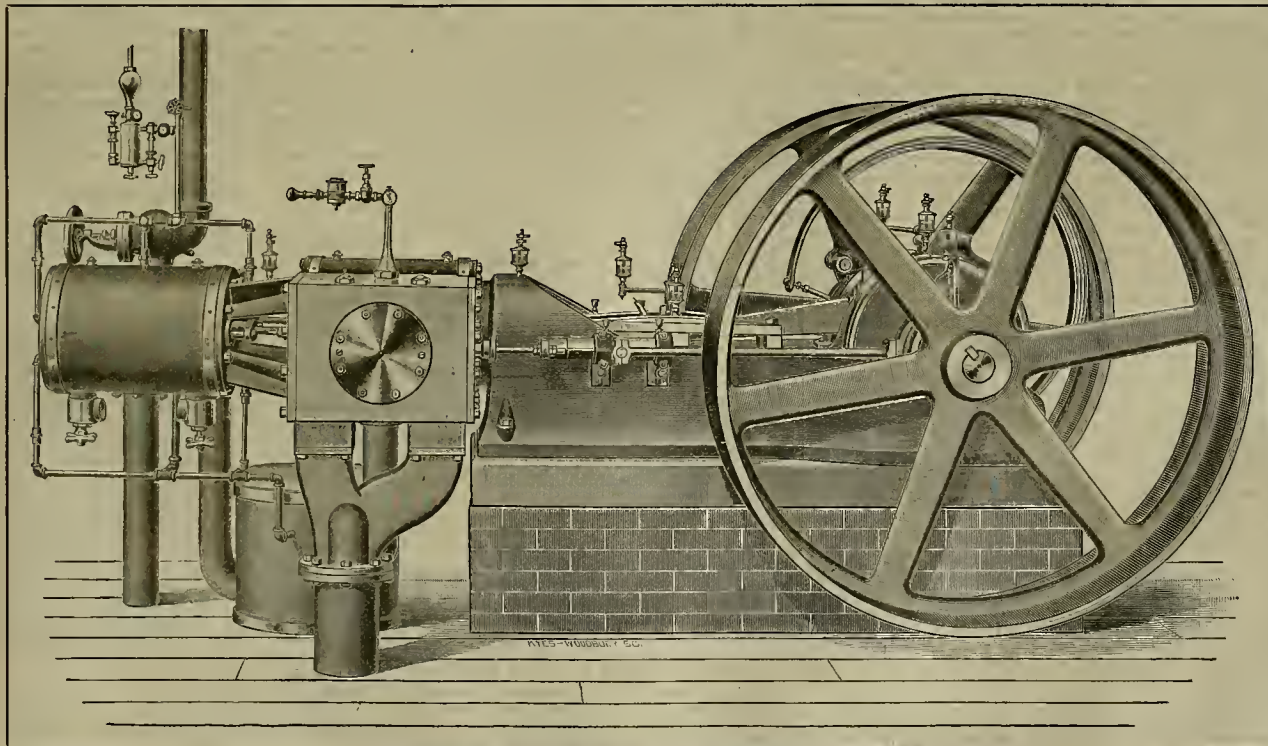
A number of good features are not shown in the cuts. The frame is made very massive and rigid by heavy internal ribbing. The lower guides are separate pieces, though supported throughout their entire length by the frame. The main bearings have cheek pieces for taking

up horizontal wear. Each one of these is backed up solidly for its entire length by a taper wedge, and can be adjusted by elevating the wedge with screws provided for that purpose. The main caps can be removed entirely without disturbing the cheek pieces or wedges, and the latter can then be removed without disturbing the shaft, exposing over one-half of the circumference of the journal. The crosshead is of the locomotive type, and is made of one piece, including crosshead pin. The latter is flattened off considerably on top and bottom, which avoids any tendency of the pin to wear out of round. The connecting rod has simple strap ends with pin and key. It is believed that this form of rod is the safest and easiest to keep properly adjusted. The governor has a great degree of freedom from disturbing influences and gives a very close regulation. The arrangement of the engine valves is peculiar and the valve seat is so constructed that it can be taken up to compensate for its own wear and that of the valve.

The McIntosh & Seymour Standard compound engine, as (Continued on page 153.)



STANDARD SINGLE CYLINDER ENGINE.



MCINTOSH & SEYMOUR STANDARD COMPOUND ENGINE.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—E.S.

Sierra County Mines.

[From our Traveling Correspondent.]

Forest City.

EDITORS PRESS:—The most remarkable feature of Forest City is the almost entire absence of trees in the town. Just above the town runs the famous Bald Mountain channel which, in the past, has been worked extensively by the old Bald Mountain Co., which worked the channel for a distance of 9000 feet and extracted \$2,500,000 in gold. At this time the Hardscrabble mine is being worked in a small way through a tunnel that enters from the center of Forest City. The principal work at this time is being done by

The Bald Mountain Extension Co.

W. Melkel Supt. The gravel is reached by a tunnel 5480 feet long. The channel is 300 feet in width. About four feet next to the bed, rock is taken out which averages \$3 to the car. The company got into the channel March 23, 1891. Recent work has averaged three ounces of gold a week to the man, or about \$57. The gold brings \$19.25 an ounce in the bar and is 96.272 fine. The company owns 20,000 lineal feet on channel and veins its stock, at this time, at \$1 a share. As there are 60,000 shares, this would make the present valuation \$240,000. When the extent of territory and value of gravel is taken into consideration, this will be found to be a very low estimate. In the gravel of the Bald Mountain, the gold is both heavy and free, the weight running from 21 ounces down, while but little gold is found below the first riffle, and almost none at all in the tailings. This has been due in part to the thorough washing that has been given the gravel before it is allowed to leave the dump-box. The company is about to erect a large hoarding-house, when it will increase its force to 100 men and then expect to take out an average of 200 ounces a week. In the old workings of this company's other channel, over \$500,000 was taken out. The Bald Mountain channel is opened at the Live Yankee mine, Alleghany, and runs there northeast three miles to the present workings of the Bald Mountain Extension.

The Live Yankee was first worked about 1852, and produced over \$3,000,000 in the six years that it was operated. It then lay idle from 1858 to 1872, when the Bald Mountain Co. got in with its tunnel on the extension of the Live Yankee. The Bald Mountain Co. worked about 400 feet on the channel, when the channel forked, the fork going north and the main channel east. The Bald Mountain extension got in on the main channel in 1881, and worked until 1888, when a crosscut channel cut them off. The company then drove the present tunnel, which brought them much nearer the gravel. This, the main channel, is considered the primary placene channel. Unlike most drift gravel mines, the tunnels are driven 24 feet below the channel, and all the gravel taken out as the mine is developed, no pillars being left.

The Ruby Co.

The company (John Colman superintendent) owns three distinct channels—the old Bald Mountain, Secondary Bald Mountain and the Ruby. The company is now putting in a stope to work ground below their tunnel.

Downville.

The Wide Awake, A. Burgan, superintendent, is north of Downville six miles, on Craycroft Hill. The gravel is reached by a tunnel 1000 feet long. The gravel has just been reached, and averages \$2.50 to the car.

At the Excelsior diggings, Fish & Berger owners, a small force of miners is at work on gravel that is good, but no account is kept of the output.

The tunnel on the Telegraph mine is being driven in to tap the channel, and is now in about 2500 feet, with 500 feet to go to cut the old Far Cap channel, that proved exceedingly rich in the early days, but was lost. It is thought that the present channel will strike it. Driving up from Downville to near Sierra City, we find

The Marguerite Mine.

The company (Fred Morria, superintendent) is having the ditch cleared out and is making every preparation to start up the mine.

The mine is opened 400 feet by shaft, and shows a 3½-foot vein of ore. The mine is equipped in the best manner possible, with all the most modern machinery built by the Eulton Iron Works of San Francisco. There are two hoists to go to 1000 feet, a 20-stamp mill, residences, shops and nine miners' houses that admit of the miners messing together. The company owns its water, which has 360 feet pressure at the mine.

Sierra City.

The old works of the Sierra Butte mine (S. Thomas superintendent) are located in Sierra City, and are closed. The ore is exhausted after producing dividends of \$1,400,000.

At this time, the company is working on the center of the Sierra Butte mine, near the apex of the mountain. To handle the rock, a mill has been erected high up on the mountain. The

mill will be used to crush the old pillars of ore left standing in the mine and the surface of the vein.

The Phoenix.

A. C. Bash is superintendent of this mine. It is just below the Buttes, and is opened by a tunnel 790 feet long that cuts the vein 450 feet deep, and here shows a 4½-foot vein. The company has just erected a ten-stamp mill on the mine.

The Wm. Tell, Casper Joos, superintendent, is two miles southeast of Sierra City, and is opened by three tunnels. No. 1 is in 50 feet, No. 2, 307, and No. 3 is now being driven and is in 200 feet. The vein runs from 6 to 12 feet, and averages \$12 a ton. The superintendent intends to continue the lower tunnel, which will tap the vein when in 350 feet, and give over 700 feet of backs. The mine has a small six-stamp mill which will give way to a larger mill, once the mine is sufficiently developed.

Butte Saddle.

The Butte Saddle, T. J. Seitz, superintendent, as its name implies, sits high up and over the buttes at an altitude of 8000 feet, and claims the high distinction of being the highest mine in the State. The property is developed by tunnel No. 1, which is in 100 feet; No. 2, of 800 feet, which cuts the vein 300 feet deep and shows 2½ feet vein. Tunnel No. 3 is started, which, when completed, will give 800 feet of backs. The company will continue its development until next summer, when it will erect a mill.

Mercer and Salinae.

This mine (J. Hutchison, superintendent) is situated six miles southwest of Sierra City, and is opened by one tunnel of 900 feet and one of 600 feet. The vein runs from three to four feet of \$5 ore. The mine is equipped with a ten-stamp mill run by water power.

The Colombo mine, Wm. Penala, superintendent, is 2½ miles west of Sierra City, on the South Fork of the North Yuba river, and is opened by two tunnels, one of 700 feet, that cuts the vein 100 feet deep and shows up a five-foot vein; another tunnel of 1500 feet in length taps the vein 450 feet, and shows six feet of vein that mills \$6 50 a ton. The mine has a 20-stamp mill in active operation.

The Garibaldi

mine, John Sannacco president, is situated 12 miles north of Sierra City in Gold valley. It is opened by a 500-foot tunnel, which shows up a 2-foot vein of \$3 ore. The mine is equipped with five stamps and is being worked under lease at this time.

The Mountain Mine

Is three miles east of Sierra City, and has new 40-stamp mill. The ore was brought down the mountain side by cable and buckets, but the plant could not be made to work satisfactorily, and the property was closed down until some other plan of conveying the ore is arranged. This mine is very well developed by tunnels; No. 1 is 850 feet long, No. 2—500 and No. 3—1200. The vein has an average width of eight feet of quartz of an undetermined value.

The Young America,

John H. Henderson superintendent; is situated near the summit of the Buttes, at an altitude of over 7000 feet and is seven miles north of Sierra City. The mill has the upper Sardine Lake just above, and the lower Sardine Lake immediately below. A more picturesque situation could not be secured, below the green waters of the lake; then the rugged mountain side extending up to the snow capped Buttes make a scene that on a hot summer day is as refreshing as the cool breezes that continually blow across the lakes from the snow topped mountain heights. The mine however does not work its scenery, nor is it included in its assets. The mine is opened by four tunnels; No. 1, or the summit tunnel is 1300 feet long and runs through the mountain top; No. 2 is a crosscut tunnel in 2200 feet; No. 3 is in 1700 feet; No. 4 was driven 2400 feet to cut the vein and then run 1000 feet on the vein which it cuts at a depth of 1600 feet and shows an average width of 10 feet of \$10 ore. The ore is brought by wire tramways and chutes down the mountain side to the 40-stamp mill, which crushes an average of 65 tons a day. The mill is run by a 6-foot Pelton water-wheel.

The average expense of mining and milling has been \$3 a ton. Recently a new ore body has been encountered in Tunnel No. 4 on the west end of the mine. The vein is here 20 feet in width. The ore has not been tested as yet, but the presence of copper, which it shows, is considered a good indication of value in this mine. The mine has produced up to August, 1891, \$1,359,235, and in addition to the cost of the fine and extensive plant with which the mine is equipped, has paid in dividends to the same date \$490,000.

Tunnels.

Sierra is the county of tunnels. This method of mining is here most popular, and is due to the great height of the mountains and their almost perpendicular sides. Sierra has repaid tenfold all who have invested in her gravel and quartz mines, and gives evidence at this time of exceeding in extent and value her past record.

E. H. SCHAEFFLE.

THE Oat mine, in Devil's Gate and Chinatown districts, Nev., has turned out \$24,000 as the result of crushing 400 tons of ore in a five-stamp mill in 27 days.

Hawthorne District, Nevada.

[From Our Traveling Correspondent GANU KENNEDY.]

This district, although but little known, produces a large amount of brilliant and handsome profits.

Your correspondent went through the Lapanta mine, and while there saw some rich ground horned out. This mine was the first discovery of gold in this part of the country. It was located in 1884, and work begun July, 1885. It has produced about \$140,000 and paid \$30,000 in dividends. The ore is free gold and the formation limestone, the ore following and being found under a belt of quartzite interstratified with lime. The ore has been followed about 1600 feet in length, and the deep-work on it is 150 feet perpendicular shaft, at which depth the recent developments show a large body of ore. The ore at present, where crosscut, shows about 14 feet in width, of which, two feet will mill from \$80 to \$100, and the balance from \$15 to \$20.

The outlook is promising for this ore body to prove very large, and it is expected to sink the shaft another 100 feet very soon.

The formation which carries this ore is quite extensive, and it is known to exist for about 1½ miles in length. But little prospecting has been done, and that entirely on the surface, and it is very probable, if the formation was prospected at other points by sinking, that extensive deposits of ore would be uncovered.

Pamlico.

The Pamlico is located ten miles southeast of Hawthorne. It was located in 1885. Active work and development were begun in August, 1887, and prosecuted until November, 1889. During this period the mine produced \$149,000 and paid dividends of \$77,000. The mine was closed down on account of litigation, which has just been decided in favor of the Pamlico M. Co., and work has been resumed within the past three weeks.

The ore is free gold, and the vein is a contact vein, the footwall being quartzite porphyry and the hanging-wall quartzite. Ore has been found all through the vein so far as developed, and continues strong in the lower workings. In some instances, as high as \$10,000 has been taken out in one sack.

Central.

The Central lies about midway between the Lapanta and Pamlico, and has been opened for 2½ years. The vein, which has been followed to a depth of 150 feet on the incline, is from 18 inches to two feet wide, the ore carrying lead, 25 per cent; gold, \$30 to \$35, and silver, 40 ounces. About 20 tons per month are shipped with four men. There is quite a large area of ground adjoining this claim, which is entirely unprospected, which, if opened up, would probably yield as well as this, as for 3000 feet in length and about 1200 feet in width the country is filled with quartz veins from six inches to two feet wide, and all carrying this same ore to a greater or less extent. The formation is porphyry, the veins running north and south and pitching eastward at an angle of about 45°.

Adjoining the Central are claims known as the New York, Hartford, Mingo and Beeson, all of which have produced more or less ore, but none of which have been more than scratched on the surface.

Between the Pamlico and Central there lies another group of claims, comprising the Mountain King, Nevada, Ohio and Mids. In these claims, the ledges are very large, being as high as eight and ten feet in width of solid quartz, the formation inclosing them being quartzite. The ore is lead, silver and gold, and runs as high as 300 ounces in silver, 65 per cent lead and 150 in gold. The ore occurs in deposits, some being quite extensive and others small; but as no system of general development has been carried out, but little is known of the veins, except at a few points. The claims in a high hill, the opportunity for development by means of tunnels, is very good. If these claims were properly opened, there is but little question but what they would prove very valuable and large producers of hailion.

Shipments of ore are regularly made from the War Eagle mine. The ore is lead, gold and silver, and the mine is paying very well.

In addition to these mines, there are several locations upon which two or three men are at work, developing the mine and extracting ore. Among them may be mentioned the Capital, Dictator, Gold Bar, Good Hope, Morning Star, Deposit, and Moonlight. The facilities for working in this district are very good; the mines being dry, the ground stands well, requiring but little timber.

The gold ore are mostly crushed at the Kinkead mills. The lead and silver ore are mostly shipped to San Francisco for reduction by the Selby Smelting Co., and Whittier, Fuller & Co. at Melroe.

Copper Belt.

There is a large belt of copper ore in what is known as the Santa Fe and Silver Star districts, the shipping points being Sodaville and Luning. The ore are largely carbonate and copper, but as there are no smelters in operation, nothing but high-grade ore can be extracted, this being shipped upon the Carson river for the purpose of making bluestone. The market is limited to 15 or 20 tons per month; consequently the copper industry, which should be flourishing, lies dormant. Here is an opportunity for an active man with a little capital and a knowledge of the copper business to take hold and develop a large and lucrative industry.

Precipitation of Metals From Hyposulphite Solutions.

[Written for the PRESS by C. H. AARON.]

The paper on the above subject, recently published in these columns, suggests a few remarks, not in disparagement, but in the interest of truth.

If the Russell process has come to stay, with its new methods and new terms, it is a pity that advantage was not taken of the opportunity to introduce the correct name of the chief agent in silver lixiviation. It is as easy to write and say thiosulphate (and this for a short technical term), as hyposulphite; and cuprous thiosulphate (or cuprous thio) seems preferable to "extra solution."

In this, and in previous papers and supplements, the author has acknowledged most of the errors which I indicated in his book on "Lixiviation," and has given me credit for one of those indications, in regard to which he shifts the fault of his mistake on to Russell, because that gentleman did not discover the whole truth, ignoring the circumstance that I had published the facts which invalidated his theory long before the book was published.

I shall now proceed to comment on the various points in the above-mentioned paper, not occupying space by quotations from it to any great extent, because those who have read the paper with the attention which it deserves, will find no difficulty in making the proper applications.

The author adheres to the old view that sodium is replaced by calcium in the lixivium when calcium sulphide is the precipitant. Is this an instance of "parrot-like repetition"? O. Hofmann found that, after three months work, his solution contained no more calcium than was due to its saturation with gypsum. This may have been an exceptional case, yet it would seem that the (anhydrous) sodium sulphate in the ore and that formed by oxidation will prevent total replacement of sodium by calcium in any case.

The statement that a calcium solution is decomposed very much faster than a sodium solution by exposure to air, seems to rest solely on a single experiment by Russell. Would it not be well to verify Russell's results before basing calculations on them?

In regard to the evolution of H₂S, during or after the precipitation, a phenomenon which I never observed, though I admit I never looked for it, I will remark that a very little of that substance is apt to make its presence known; carbon dioxide will cause its evolution from the polysulphide; air contains carbon dioxide. In the vicinity of fire it may contain a good deal, to say nothing of the breath of many workmen in a confined space. Air has constant access to the sulphide and to the lixivium, the latter especially during the stirring. Should not this be taken into consideration?

O. Hofmann has shown that recently made calcium polysulphide contains a good proportion of thiosulphate. I proved the same fact, and, moreover, proved that the proportion was increased by or during continued holding.

The making of CS₂ requires a larger proportion of sulphur than the making of Na₂S₂, but the precipitate always contains a quantity of free sulphur, and if this is recovered by either of the methods which have been proposed by me and by others, the ultimate consumption will not differ greatly, as between good lime and soda, if the lime is properly used. For my part, on the principle of working, like electricity, along the lines of least resistance, I should prefer the sodium compound on account of its more facile preparation—that is, other things being equal; but among the things which may not be equal, I will mention the great liability, to put it mildly, of the sodium sulphide to contain caustic soda, necessitating the use of some means of neutralization. As to the means, Russell uses sulphuric acid, which is not easily obtained in some localities. I have indicated other methods in the MINING AND SCIENTIFIC PRESS of Dec. 22, 1888, and have shown the advantages of anhydrous acid for the purpose.

The experience of O. Hofmann, at the Silver King, in the great increase in volume of his lixiviating solution, must not be taken as a general criterion. It seems to have been exceptional.

In regard to the "Precipitation of calcium by sodium sulphide," I would ask: Is it by the sulphide or by caustic or carbonated sodium in the sulphide solution? In my article in the PRESS before mentioned, I showed that caustic in the sodium sulphide can be removed by an addition of calcium sulphide with precipitation of calcium hydrate, which seems to show that calcium hydrate, or hydroxide, is insoluble in solution of sulphide.

The author seems to deny the formation of lower sulphides than CaS, in the boiling of lime with sulphur in water. Regnault says, in *Cours Elementaire de Chimie*, French edition of 1851, from which I translate: "If the boiling is not sufficiently long continued, and if the liquid be filtered hot, one obtains a yellow solution which deposits, in cooling, orange-colored needle-crystals of bisulphide CaS₂. This sulphide is very slightly soluble in cold water." I have seen the crystals more than once, but did not analyze them.

"Very concentrated solutions of the higher polysulphides" are not essential to "a high coefficient" of precipitation, as has been proved by Russell and by me; yet it may be that a very diluted precipitant will act differently,

owing to a moliscian change caused by dilution. The sulphide solution, as prepared for milling, give what the author terms "a high coefficient."

The fact seems to be, and is if my theory is the true theory (*E. & M. J.*, Dec. 26, 1885), that the normal coefficient for a polysulphide is 360 parts of silver for 100 parts of caustic soda (or an equivalent of lime). That the practical coefficient is reduced to, or nearly to, 180 is due to a secondary reaction, as I have shown, and a practical coefficient above 180, in continuous working, can only result from the loss of a portion of the lixiviating solution containing some of the tetrathionate formed during the precipitation of the silver, which may be prevented, and the whole of the tetrathionate converted to thiosulphate, by what the author terms "overprecipitation" in each operation. Again, there is no room to question the decomposition of a portion, and an increasing proportion of the tetrathionate, simultaneously with the precipitation of metal. It is proved first, by the diminishing coefficient as the operation proceeds; second, by the increasing production of a whitish cloud of free sulphur; and third, by the almost complete conservation of the solution, even though "overprecipitation" be not practiced. But to admit these proofs would be to admit my theory of precipitation, which the author is not yet prepared to do, though confessing his own to have been wrong; he prefers to dismiss the subject as being "of no economical value," though, in fact, the mere theory of the reaction never had any economical value, and the scientific value is as great as it was ever supposed to be. If the high coefficient were practical, that fact would be the only thing having any (immediate) economical value; why then should he have built "an elaborate theory" on it, or why not now continue the investigation in the light of the new fact? Perhaps the author may think the subject worthy his attention in a future paper, or in a second edition of his book.

The paper as a whole does not make out a strong case for sodium sulphide as against calcium sulphide, and in other respects it indicates a change of base, on the part of the author, as to Russell's process. I have a strong suspicion that, however interesting the new reactions discovered by Russell may be, his process, as a whole, will soon be found to be a game that is not worth the candle.

In regard to the tables in the latter part of the paper, I will remark that, if recovery of the free sulphur be practiced, the showing would be much more favorable for calcium sulphide.

THE WAY TO RISE.—"Ten years ago," said a Tennessee machinist, "I had a little machine shop, with four journeymen, and 'Sim' for an apprentice. In the spring rains I took a severe cold, and didn't go out of the house for four months. I worried a good deal, for I expected my little struggling business would go to the wall soon, but most of the time I was too sick to think much of the matter. Finally, when I got so as to get out, I wandered down to the shop. Instead of four journeymen, I found nine, and Sim was busy in the little 7x9 office closing a contract with a rich inventor to build a steam road wagon. It seemed," said this machinist, "that during my sickness Sim had been in consultation with my wife, and that she, with a woman's intuition, had let him go ahead about as he pleased, and his way—with only his three years' experience—had been a better way than mine. He always had money to pay off Saturday night, and there was a little standing to my credit. The old shop had a brighter look than ever before. The windows were clean, and some tons of old junk had gone to my neighbor's foundry in payment for good castings. Sim had ordered a new lathe, fixed up the old engine, lued up the line shaft, and had the floor swept out and the walls whitewashed. Sim and I," concluded the narrator, "are partners now, and the only thing I really miss is the little old shop that he made look homelike."

Heavy Hoisting Engines.

The new type heavy hoisting engine which the Lidgerwood Manufacturing Co. lately placed upon the market has received a flattering reception. Thirteen of them have already been sold in less than a year. The following endorsement from the president of the Vermont Marble Co., Proctor, Vt.—Fletcher D. Proctor, son of the present Secretary of War, is notable:

JULY 31, 1891.

Lidgerwood Manufacturing Co., New York, N. Y.—GENTLEMEN: The two-drum hoisting engine which you sent us last spring is a success, and we do not hesitate to recommend it for what you claim for it. It runs two derricks with one engine hoisting 20-ton blocks without any trouble 152 feet in a minute and a half—this with a steam pressure about 60 pounds, 300 feet away from the engine; and I am satisfied that with a stronger pressure it would hoist this weight in from a minute to a minute and a quarter. The workmanship of the engine and power is perfect, and we can heartily recommend it.

Very truly yours,
VERMONT MARBLE CO.,
(Signed) FLETCHER D. PROCTOR, Pres.

The Gallup (N. M.) coal miners have declared their strike off and gone to work again on the terms offered by the companies.

The Pacific Coast Empire.

The commonwealths of the Pacific Coast constitute an empire which is peculiar in situation, grand in extent and resources, unique in industries and to the spirit of its people. It is true that there are differences in the resources, industries and peoples of the States and Territories of the Pacific slope, but they agree in being far more unlike the other regions of the country, than they are unlike each other and thus have strong mutual resemblances.

As the years progress, we believe these splendid portions of our great domain will become more like each other, a gradual process of assimilation will prevail, and the people be more strongly knit in sympathy and in political and commercial affiliations than they now are. We do not, of course, mean that they will grow more unlike the rest of the United States as they grow more like each other, or that their development will ever make National bonds wearisome, but there will be more of the family feeling and fervor in the slope group of commonwealths, and as family union and harmony are at the basis of human civilization, so will the unification of the Pacific Slope be but an element of strength in the National advancement.

This *sui generis* character of the Pacific slope has never been adequately appreciated east of the Rocky mountains, nor have our different conditions and needs figured properly in the national councils. There is discernible now a change in the Eastern view of the farther West and a truer appreciation of our affairs is there prevailing. This progress in the Eastern mind in our favor will be advanced by a very proper attention, which has been recently given us by the Government. The visit of the President and some of his cabinet has helped us even if it has been held to have something of personal political motives in it. The good accomplished far outweighs any narrow considerations, even if such existed. Another aid to the slope to place itself properly before the public mind of the country is a special government publication by the U. S. Bureau of Statistics, of which we learn through the *New York Tribune*, a journal which is cordial and generous in its allusions to our slope in connection with the facts which it gleams from the government publication. We quote as follows:

"The volume will be read with gratified amazement. It deals with the development of the Pacific Slope, including the States of California, Nevada, Idaho, Oregon and Washington and the Territories of Utah, Arizona and Alaska. It is possible to give here only a vague impression of the wealth of facts and statistics applied in this book, and of the magnificent tribute they bear to American energy. Their story is almost incredible. The lands comprising these States and Territories, exclusive of Alaska, constitute quite a fourth of the total area of the United States. Alaska, acquired by purchase from Russia in 1867 at a cost of \$7,200,000, has already returned in revenue to the Treasury more than its purchase price, and has produced in values to our citizens not less than \$85,000,000.

"This lack of appreciation in regard to the possibilities of our Western empire has marked every controversy attending their acquisition, and the wonder is that we ever succeeded in obtaining so great a dominion. Jefferson was cruelly assailed for the Louisiana purchase. The Mexican cession was bitterly opposed, even after the decision of a great war had made it one of right. Two years were spent in a bitter fight over the Alaskan treaty, the opposition in all these cases holding that the land would never be needed, and that it was utterly worthless anyhow. British Columbia was sacrificed to the foolish outcry, to the great and permanent injury of our interests. The Mexican cession cost us \$30,000,000, or about 12 cents an acre. We have carved from it California, Arizona, Nevada and Utah and parts of New Mexico and Colorado, and from about one-twelfth of the lands denounced as sterile and valueless we have produced \$1,800,000,000 of gold and silver and 20 times as much in cereals, lumber and fruit.

"Of the 625,000,000 acres contained in the Pacific Slope, 369,000,000 constituted Alaska. Of the remainder, much less than one-half has been as yet surveyed, and not more than 40,000,000 acres can be called improved lands. From these, the agricultural results have been obtained, and it will certainly surprise the public to know that in the last five years the total wheat crop alone has been equal to the total product of silver and gold, while in Oregon, which has produced in 21 years \$17,513,787 of precious metals, the wheat product has amounted in value to \$142,653,627; and it must be remembered that these States, excluding Alaska, contain only 2,268,958 people, more than one-half of whom have come in during the last ten years.

"With an annual product of wheat now exceeding in value \$60,000,000, of salmon \$1,800,000, of lumber \$5,000,000, of other cereals than wheat \$20,000,000; with an annual wool clip of 80,000,000 pounds; with farm animals valued at over \$164,000,000; with savings bank deposits amounting to \$167,396,157; with 11,474 miles of railroad, representing an investment of \$542,792,231, and annual earnings of nearly \$65,000,000; with a foreign commerce of more than \$100,000,000 and a permanent tonnage of 357,000 tons registered; with tax-paying property assessed at \$1,652,075,859, and worth,

in fact, fully \$3,000,000,000, it is certainly fair to claim that the Pacific slope is a country of superlative achievement and inexpressible resources."

We have made a long quotation but the statements are so significant to our Pacific slope people that we can not do less. There is, of course, first a deep sense of gratification to those who are making homes on this grand division of the country to have their work and their heritage so well spoken of, but this pleasant sensation will be counted merely a passing variety when the significance of such facts thus proclaimed to the world is considered. Such a country with such wealth produced by so few people and such vast areas untouched!

This will ring in the ears of the world and re-echo in investment, settlement and progress. We believe that some who now live will see a growth of the Pacific slope which all present achievements but dimly foreshadow. Every proclamation of truth will hasten that day, every good enterprise honestly undertaken and carried on hastens it. Thus it becomes a theme for personal congratulation—a field for individual endeavor, a reward for every stroke of honest toil.

The Postal Telegraph Abroad.

Interesting accounts have been received at the Post Office Department, Washington, from Henry George, Jr., a newspaper correspondent now supplying a syndicate of American daily newspapers with letters from England touching the postal telegraph system in that country. He says the charge for telegrams to all parts of the United Kingdom is one cent a word, including the address, the minimum charge being 12 cents for 12 words or less. Ordinary postage stamps are affixed to the messages in payment. A moderate additional charge is made when the addressee lives beyond the limits of the free-delivery. Telegrams can be repeated at half the original cost. The cost of a reply not exceeding 48 words may be prepaid, and a "reply form" is then delivered to the addressee, who can send his reply from any telegraph office within two months. Five figures are counted as one word; in this country the telegraph companies count every figure a word. As a measure of economy where many messages are likely to be sent, an abbreviated or arbitrary address may be registered for five dollars a year. In addition to these direct benefits, the people enjoy very substantial indirect advantages, such as result from a cheaper service for newspapers and news agencies.

The rate for news messages to all parts of the Kingdom is 24 cents for every 100 words transmitted between six p. m. and nine a. m., and during the day it is 24 cents for every 75 words, with the additional charge of four cents per 100, or 75 words, according to the hour, for every duplicate telegraphic communication. A correspondent in London with 300 papers on his list, for instance, pays for sending out a piece of news after six p. m. at an average rate of a fraction over four cents per hundred words. In this way, Mr. George says, the vast bulk of the news telegraphing is done.

The Delaney multiplex is one of a number of American inventions in use in England, by which it is possible to send out six messages over a single wire at one time. The British government pays \$10,000 a year royalty on it. Although it has been in profitable use there five years, it has been steadily reinforced in this country where the companies have no need of inventions that would increase their facilities and reduce their charges. A prodigious amount of work in an incredibly short time, is accomplished in the English postal telegraph system by the Wheatstone automatic process. This is an English invention, transmitting 400 words a minute, and is used in newspaper telegraphic work.

Since the government regulation of the telegraph lines in England, the number of telegraph offices has been increased from 2,488 to 7,600, the rate has been reduced more than one half, and press rates cut down to a fraction over four cents per hundred words; and, more important than all that, the service has been equally and impartially cheap to all. Universal sentiment, according to Mr. George, testifies to the immensely greater convenience and efficiency of the postal telegraph system, and no one would ever think of going back to the old plan of private companies. Mr. George thinks that as good, if not a better, postal telegraph system could be established in the United States. The American letter service is really much cheaper than the English, taking into account the fact that our territory is 30 times larger; and electrical invention, instead of being checked, would be stimulated.

A YOUTH'S INGENUITY.—A boy we know, says the *Cleveland Leader*, had some chickens of which he had made pets. He and his father went to their work early in the morning, and while the rest of the family was away for the summer, it became a question how the chickens were to be fed with proper regularity. The boy was equal to the occasion. He took an alarm clock and fastened it securely to one side of the barn by means of two spikes. Next he hung a bucket of corn to a rafter and connected it with the clock by a stout cord. He wound up the alarm and set it at 4 o'clock. At that hour the alarm went off, wound up the string and tipped over the bucket. And so the chickens were fed by clockwork.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

OSCEOLA CON. M. CO., August 4. Capital Stock, \$100,000. Directors—J. W. Brown, J. Wray, J. Wertheimer and G. Goodman.
GRAY SPRINKLER CO., of California, August 5. Capital Stock, \$100,000. Directors—L. H. Newton, E. H. Marwedel, S. G. Murphy, Arthur Briggs, C. F. Hamilton, Sampson Tams and Barclay Herley.

SAWYER TANNING CO., August 8. Capital Stock, \$100,000. Directors—S. E. Holden, A. W. Norton, E. Manasse, Homer F. Norton and Martha W. Sawyer.

KOHLER & CHASE, August 8. Capital Stock, \$500,000. Directors—Q. A. Chase, Cardelia A. Kohler, Eunice M. Chase, E. C. Chase and Thos. P. Winter.

SWEDISH PUBLISHING CO., August 9. Capital Stock, \$5,000. Directors—F. B. Hulting, F. E. Erickson, A. G. Spencer, A. Allson and J. O. Kerblad.

LANDLORD'S PROTECTIVE AND MERCANTILE AGENCY, Aug. 24. Object, to conduct an agency for the collection of debts and for dealing in real estate. Directors—J. O. Jackson, Wm. Ogston, H. C. Boyd, D. M. Gavigan and A. J. Brunner.

DUMBARTON LAND CO., Aug. 26. Capital stock, \$1,000,000. Directors—Geo. V. Metzger, Philip Zimmerman, Wm. L. Merry, W. W. Montague and Philip Rohrbacher.

WRIGHT, BOWNE & CO., Aug. 26. Capital stock, \$500,000. Directors—W. S. Bowne, M. E. Wright, E. H. Hanton, J. H. Whitman and C. C. Bruce.

N. P. PERINE CONTRACTING & PAVING CO., Capital stock, \$500,000. Directors—N. P. Perine, F. Walker, R. C. Mattingly, Thos. Carter and J. D. Enright.

SAN LEANDRO LAND, WATER & STONE QUARRY CO., Aug. 26. Capital stock, \$250,000. Directors—R. E. Newland, E. H. Barbee, W. D. Smith, D. Hughes and G. F. Dyer.

CLINTON CON. M. CO., Aug. 26. This company has filed in the office of the County Clerk a certificate of the increase of its capital stock from 60,000 shares, at a par value of \$50 per share to 100,000 shares.

The College Woman.

The girl graduate has not carried off all the honors awarded her sex during this commencement season. The middle-aged woman has her day as well.

Mrs. Gertrude Bowen, whose husband, the Rev. William C. Bowen, former president of the Boardtown (N. J.) Female College, died recently, has been appointed president of the college by the Board of Councils.

Mrs. Georgia Kendrick, of Poughkeepsie, N. Y., wife of the late Rev. Dr. Kendrick, has been elected lady principal of Vassar College.

Miss Ella Sahl, Superintendent of Schools at Portland, Oregon, and a graduate of the Wisconsin State University, has accepted the principalship of Downer College, at Fox Lake, Wis., at a salary of \$3,000. Downer College was formerly called the Wisconsin Female College, but the name was changed at the request of Judge Downer, of Milwaukee, who left it property valued at \$70,000. He was president of the board of trustees for many years. Mrs. Downer also left the college a large bequest.

At least two hallowed sermons were preached by women this year—one at Swarthmore College, Pa., by the Dean, Mrs. Elizabeth Powell Bond, the other at the Central Academy of Plainfield, Ind., by Mrs. Mary F. Moon, pastor of the Friends' church at that place. Both institutions are coeducational.

At Syracuse (N. Y.) University, which, as Geneva College, admitted women by the terms of its charter, and graduated a woman in its first-class in 1853, Mrs. Selva A. Lockwood was the orator of the alumni. Her subject was the conservative force of the college and university, with some comments upon university extension. Mrs. Lockwood graduated from this institution 34 years ago.

At the Rookford (Ill.) Seminary, Miss M. A. Jordan of Smith College, delivered an address before the graduates on "The Literary Aspect of the Civil War." At Laselle Seminary, Ansbardale, Mass., Mrs. Abha Gould Woolson delivered a critical address before the Alumnae and friends upon "Women of Dr. Johnson's Time." At Ingham University, Le Roy, N. Y., Rev. Anle F. Eastman, of Canandaigua, gave an address on "Culture."

At Central College, Ky., the degree of A. B. was conferred on three married women: Mrs. Mary N. Root, Mrs. Caroline Y. Douglas and Mrs. E. H. Rutherford. This singular event in a college for men was explained by President Young, who said that formerly daughters of professors had the right to study with the classes and graduate. These ladies of high degree had done so years ago, and it was but tardy justice to grant them their diplomas.—*Woman's Column.*

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of the Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCRIPPS PAXSON Patent Agency (S. P.) from week to week and year to year.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alpine.

AT HIGHLAND LAKES.—Cor. Calaveras Prospect, Aug. 28: The mining excitement of the Highland Lakes continues unabated, and many are the tales that are told of the fabulous rich float ore that has been found in that wonderful region. J. C. Curtis and E. B. Christ have just returned from there after a week's research, and though somewhat noncommittal, have expressed themselves as having met with much encouragement. Geo. Taylor, an old prospector from Arizona, who has been in all the principal mining countries in the United States, started for the Highlands this morning. It is their intention to make a thorough inspection of the region and study the geological make up of that vast mountain wild. The season for prospecting there is short, and consequently work must be ambitiously pursued. From all the reports of former discoveries, there must certainly be one or more good ledges there, though they have never been found or located; the rich float ore leads to the belief of their positive existence, and it is now only a question of good fortune as to who will make the discovery. It is near this place that the remains of an old arrastra were found, presumed to have been worked by Mexicans years ago. The locality being of such a precipitous nature, it is undoubtedly going through a material change annually, and is therefore somewhat puzzling to those concerned.

Amador.

NEW YORK MINE.—Ledge, Aug. 29: It is the intention to put up a large Huntington roller mill on this property—one that embodies vast improvements over those of the same make heretofore erected in the county, and capable of doing much more work. It is claimed that the one to be put on this mine will crush 30 tons per day. The mill for the New York will be shipped from the S. F. foundry this week and will be here the latter part of this, or the beginning of next week. The manufacturers are under engagement to send an expert to run the mill for a month. It is expected to have it running inside of a month.

QUARTZ MOUNTAIN.—This immense deposit of quartz, situated about two miles east of Amador City, has heretofore defied all efforts to work it at a profit. The ore is of very low grade, as far as free gold is concerned. This is conceded on all sides. Its principal value lies in the sulphurets. These are enormously rich, assaying as high as \$800 to \$1000 per ton. They are, however, very fine, and all methods so far tried to catch them in paying quantities have failed. Now an effort is being made to work the old mountain by a process which has for its main object the saving of these fine rich sulphurets. After leaving the concentrators, the tailings from a ten-stamp mill will pass over canvas 120 feet long and 14 feet wide, and after this will run the gamut of a number of settling tanks like those in successful operation at the Gover. The present operations bid fair to make this a paying property. There is nothing in the county to equal the science displayed in the saving of the sulphurets at the Gover, and this process, considerably amplified, is to be applied at Quartz Mountain. If it turns out a success, it will open up one of the biggest mining enterprises in the county, as the supply of quartz is practically inexhaustible.

BELLWEATHER.—The developments in this claim, which is within the Jackson townsite, have taken a decidedly favorable turn of late. In drifting west at the 100-foot level, the ledge has been struck, showing much richer than was expected. The vein has been followed 18 feet. Its full width has not yet been ascertained. Assays from different points yielded from \$24 to \$35 per ton. The average is estimated at \$15 per ton. At the head of the drift the vein shows six feet wide, with neither wall exposed. The indications seem to point that the ore body will open out into vast proportions at an increased depth. Everything now points to this claim as a valuable and permanent mine. Mr. Bright has spent a large sum in opening it so far, and has the satisfaction of knowing that the developments exceed his most sanguine expectations. It is reported that negotiations are in progress for the starting up of the Moore mine, near Jackson. The attachment levied on the Macatto mine at Irish-town was released this week, under instructions from the plaintiff. It is said the debt of \$1500 on account of which the attachment was issued, was contracted under the former ownership of the property.

Calaveras.

INDIAN CREEK.—Calaveras Prospect, Aug. 28: News comes in almost daily now regarding the Wood's mine and its development at Indian Creek. Quartz has been found in abundance, and there is seemingly no scarcity of ore at present. The main tunnel has been upon a large quantity of quartz that can be quickly taken down at any time. It is becoming apparent that that district is upon the verge of another boom. It is now rumored that Hayward & Hohert contemplate the purchase of the old Calaveras mine. If this proves true, and such men and representatives be once interested in a locality, work will not be half done, but well done. How strange is the history of mining in Calaveras. Mining towns that went down to years of dullness have been rehabilitated, revived and raised to glittering orbs in the mining firmament. Indian Creek has seen its mines lay in comparative idleness for years, and just now it seems as though all was born again, and the people are heralding a new era with praise and thanksgiving.

GOOD ROCK.—We were shown some good rock this week from the mine of B. D. Beckley of Salt Spring Valley. We understand that this mine has been leased for a term of three years; to some parties who are to commence extracting ore at once. Mr. Beckley has already sold some of this rock for a good round sum per ton.

El Dorado.

AT GREENWOOD.—Georgetown Gazette, Aug. 28: While at Greenwood last Monday, we were pleased to learn that active work has already commenced to open up and thoroughly develop the famous old North Cedarburg mine, under the management of the New El Dorado G. M. Co. of Oakland, S. A. Moss Supt. Eight men are now at work sinking shaft and opening old tunnel, and it will not be

many weeks before the working force will be increased. We are glad to know Dr. Martin is making a well planned attack to successfully capture the treasure held within the walls of the old Cedarburg, which has so long resisted the attempts of small unorganized and poorly equipped expeditions sent against it.

BEAR CREEK MINES.—The Darling mine, which at present is being worked by a San Francisco company, is located about seven miles southeast of Georgetown, on divide between Bear and Rock creeks. This mine was first discovered by the Wagner Bros. about ten years ago, who located the claim and sunk a shaft about 30 feet deep. It was abandoned by them and afterward relocated by A. Darling & Sons, by whom it has since been worked. Five or six years ago Mr. Darling built a two stamp mill which he run whenever there was sufficient natural water. He has done a great deal of work in sinking and running tunnels, and has always had fair prospects. Last June he bonded his mine to a company who has since erected new hoisting works, and are putting the mine in order to do some extensive prospecting. The shaft is now down over 80 feet, or 40 feet deeper than ever before penetrated. This company intends sinking 200 feet and running levels and crosscuts. So far, everything seems encouraging for a good mine. Two miles south is the Martin & Ambros mine, now bonded to W. S. Lyle. Two tunnels have been run on this claim at different levels, in both of which the ledge prospects well. W. B. Gibbs, who has a contract for running these tunnels, is bringing his work near to completion, so we may soon look for some extensive improvements on this mine. Last, but not least, is the Cook & Wagner mine, about two miles directly west of the Darling mine. This mine was located about three years ago. The owners have sunk a shaft 90 feet deep, and have found flattering prospects all the way down. At present this mine is prospecting better than ever, and the owners think they have the best mine on this divide.

Butte.

TAPPED THE INCLINE.—Cor. Oroville Mercury, August 28: It will no doubt be interesting to many Butte countians to learn that the incline of the old Buchanan Hill mine has at last been tapped and the imprisoned waters let loose. The present owners of this mine Messrs. Solomon and George Williams have been at work for over two years to tap this incline, thereby making a continuous tunnel through the hill from east to west, and had run a distance of nearly a thousand feet. The Messrs. Williams intend to put a flume in their tunnel and expect to wash up tons of rich paying gravel, much of which in the old incline is now in sight. This mine has been worked by various persons for over 30 years and large returns have been realized. The mine, formerly owned by Wm. Merrithew, Mr. Harris and others, was sold some 13 years ago to a S. F. company who put up an engine and pumping outfit, but seemingly found the effort to pump the incline dry a failure or too expensive; abandoned the mine and it fell into the hands of the present owners, the Williams Brothers. About two years ago the Smith Brothers and Henry Curtis leased this mine and took therefrom over \$1500 in a short time. Now that the incline is tapped and presumably the best part of the mine drained and laid open to a better working, there is little doubt but that the owners will reap rich returns for their labors.

Mono.

PATTERSON DISTRICT.—Bridgeport Chronicle-Union: The Rattler has a large amount of good ore piled up on the dump, and considerable rich ore has been sacked for shipment. This mine promises to be a very valuable property. Judge J. C. Murphey is pushing work on the "88" claim, and seems to be greatly encouraged, believing he will have a good mine. John Sheehan has struck a body of rich ore in the Kentuck, formerly well known as the Summers Con., and has taken out ore that will work up into the hundreds. A. P. Sayres is hard at work on his Homestake, and is taking out good ore, which he ships for reduction, and thereby keeps the "wolf" at a goodly distance from his door. He has "a good thing," and is in no hurry to "give it away," but he will be liberal to a live company, as he has adjoining interests, which would be brought to the front by an energetic and intelligent working of the Homestake. The Patterson district is showing up well, and is worthy the attention of mining men. There is much good work being done in the district by close-mouthed prospectors, who seem to be well satisfied with their prospects, but make nothing public.

THE DUNDERBURG.—The new track has been laid in the tunnel, and ore will now be taken out for shipment to San Francisco for a thorough working test of a large quantity. The result of the working will be anxiously looked for by our citizens, who believe the Dunderburg to be a valuable mining property.

GREEN CREEK MINES.—Mike Ryan and Thos. Ward have been quietly at work on the Grove Creek mine, about 11 miles from Bridgeport, having run three tunnels and tapping the ledge in each, getting prospects that have encouraged them to erect an arrastra, which they hope to have running in a short time, and they confidently expect it will soon enable them to put up a small stamp-mill, as it is said they have plenty of good ore to work.

Nevada.

IMPORTANT STRIKE.—Grass Valley Telegraph, August 27: Probably one of the best mining properties in this district is the Union Hill mine, which has just resumed work after being idle since 1870. The mine was worked by an English Co., and just why it was shut down has always been a mystery to everybody who knew anything about the mine. A New York Co. is now operating the mine, with E. A. Wiltsee as superintendent. We are reliably informed that a most important discovery was made in the mine Wednesday afternoon. The new shaft or continuation of a small prospect hole is being sunk about 1100 feet west of the old shaft and is being done in order to strike the ledge below the shaft, where old Halphine once worked and got out such rich ore. The result is that at the depth of 48 feet a ledge varying from 16 inches to two feet was cut and a great number of pieces show coarse gold freely, while pieces that gold could not be seen in with the naked eye were "bruised" up in a mortar and as a result a good prospect was obtained. It is variously estimated that the ore from the mine will go from \$25 to \$50 per ton, nor is it a large estimate, judging from the past brief but brilliant

history of the mine. Only 10 feet have been sunk on the old prospect hole but the size and quality of the ledge at the recent depth (48 feet) is most encouraging and is almost a guarantee that the Union Hill mine will come up to the expectations and prophecies of so many miners who are acquainted with the ground and who say that it will prove one of the best mines in the district.

IDAHO MINE.—Grass Valley Union, Sept. 1: Some high-grade ore was struck in the shaft of the Idaho mine, the latter part of last week below the 2200-foot level. Some of this ore will be shown at the District Fair pavilion, being from the greatest vertical depth that has ever been reached by mining in this district.

STRIKE IN THE CRAIG.—Transcript, Aug. 28: Some very rich gravel has been found this week in the drift claim owned by the Craig Bros. and situated in Cement Hill district. Forty-five dollars was obtained yesterday from 12 candle-boxes of dirt.

Placer.

GRAY EAGLE.—Herald, Aug. 29: The Gray Eagle mine, located on the divide a short distance this side of Forest Hill, is now working about 15 men, and times around there are livelier than for some time. Everything is in good shape, and the mine is looking well.

PROSPECTING.—The McCarty Bros. of Rock Creek have commenced prospecting near the old Yolo mine, on Bald Hill. They have uncovered the ledge just north of the Yolo shaft, and have struck good prospects.

Tulare.

THE 99.—Visalia Times, Aug. 27: The 99 mine, owned by the Mill Creek Mining Co., now has a tunnel 120 feet in length run in on the veins. Another tunnel 60 feet in length is now being run. Assays from the rock yield from \$30 to \$115 per ton. Offers have been made to purchase the property, but the owners have refused. Work will be pushed on the mine, and it will be fully developed.

NEVADA

Washoe District.

CON. CALIFORNIA AND VIRGINIA.—Chronicle, Aug. 29: There has been extracted from all parts of the mine during the week 965-950 2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all of the ore worked at that mill during the week was \$21.50 per ton. Bullion shipped to Carson Mint, \$15,700.45. Bullion now on hand in assay office, assay value about \$12,000.

OPHIR.—We have extracted and raised to the surface 33 tons of ore, the average assay value of which is about \$18.50 per ton.

MEXICAN.—On the 1465 level, the south drift started from the east crosscut No. 1, at a point 518 feet in from the main north lateral drift, has been advanced 33 feet; total length, 220 feet; in vein porphyry showing clay separations.

UNION CON.—The northeast drift started from the east crosscut No. 2 on the 1465 level, at a point 853 feet in from the main north lateral drift has been extended 32 feet; total length, 191 feet, continuing in a harder porphyry formation.

ANDES.—On the 420 level north drift from east crosscut, No. 3 was extended 18 feet in quartz formation.

CHOLLAR.—The north lateral drift from the incline station, 1500 level, is out 18 feet; face in porphyry.

POTOSI.—The east crosscut, 140 feet north of south line, 1300 level, is out 83 feet; face in porphyry. The chutes and station are completed, and the north and south drifts started from the 1400 level winze.

WARD COMBINATION SHAFT.—The joint south-west drift from the shaft, 1800 level, is out 228 feet; face in clay and porphyry.

UNION SHAFT.—The west drift from the 900 level is out 1009 feet, 52 feet having been made during the week.

UTAH.—The southeast drift has been extended 37 feet; total, 210 feet, continuing in a porphyry and quartz formation.

SIERRA NEVADA.—On the 630 level west crosscut No. 1 from the northwest drift, 571 feet from the shaft has been advanced 45 feet; total distance, 900 feet; the formation for the last 12 feet was a mixture of porphyry, clay and quartz.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine a total of 305 tons of ore of the average value of \$19.20 per ton. Have started a winze on 650 level at a point 100 feet south of station, and it is now down five feet in fair-grade ore.

BEST AND BELCHER.—1100 level: East crosscut from northwest drift was connected with a west crosscut from the Con. Va. mine on the 23d inst. Have done considerable repairing on the 1200 level during the week.

GOULD AND CURRY.—200 level: North drift 65 feet above this level has been extended 25 feet through soft porphyry and stringers of quartz; total length, 90 feet. At a point in this drift 85 feet from upraise started last crosscut No. 2 and extended same to feet; face in clay and quartz, showing some value. Have been repairing and retimbering upraise during the week.

ARIZONA.

TOMBSTONE.—Prospector, Aug. 29: Tombstone, as quiet as it apparently seems, is to-day one of the best camps on the coast, not only for its residents, but for legitimate investors in mining property. Nowhere else in the southwest has such a showing been made in silver production as she has recorded; nowhere has the ore been of a higher average grade and nowhere has it been easier of reduction. Though the water problem is a poser that will throttle the district perhaps for many a day, that, and that alone, prevents Tombstone from being the largest silver producer, outside of Leadville, on the continent. Nowhere in the camp has water been reached that ore did not follow. The fact that in some cases it was low grade at the high water marks cuts no especially bad feature except to the croaker. West Side, Emerald, Contention, Lucky Cuss, Grand Central, Sulphuret, all show ore going down into the water, and though in some places the ore at water level is low grade, in many places it is of a very handsome grade. The ore treated from the Emerald averaged 22 to 30 per cent lead and 65 to 70 ounces of silver, and this is the same grade of

ore that still continues on the 700-foot or water level in the two to four foot quartzite fissure of that property, which has been drifted on at this depth for 1350 feet, while the big bodies of ore below water in the Contention that were sank on while the pumps were running averaged low grade, ore going way up in the thousands was also found in small quantities. The Lucky Cuss, as shown by the annual report of that company has fine pay ore right in the bottom of the high water level. Though miles of work exist in this camp above water level, there are still vast blocks of ground that are still unexplored and are just as likely in surface indications as others that have been producers, to say nothing of the blind blankets and deposits that in reason exist.

MONTANA.

ZOSEL DISTRICT.—Anaconda Review, Aug. 29: A new mining camp has been coming into prominence this season from a district heretofore almost unknown. We refer to the Zosel district, about seven miles east of Deer Lodge. Up to six months ago there had almost been no work done in that vicinity. Since that time there have been several important discoveries and considerable work done on them. The character of the ore is carbonates, which continues for about 60 feet, where it changes to a galena mixed with arsenical iron, and averages from \$47.50 per ton per car to \$68. There have been several important discoveries within a mile of these claims that give promise of being valuable mines with development work. New finds are being made almost every day. The camp is most favorably situated, being only seven miles from Deer Lodge, with good roads and an abundance of timber and fine water. There are at present about 70 people in the camp, which contributes about \$5000 per month to the wage-earners of that place. From the date of its discovery it has been a shipping camp, the mines paying for their own development, thus demonstrating that it was a poor man's camp. A mile and a half to the south are prospects equally promising that have lately been found. The ore at this place differs a little from that at Zosel, being more of a chloridizing and milling proposition. These ledges can be traced for several thousand feet and lay in a porphyry belt, which is here several miles wide and is supposed to be the same as those in which the Elliston properties are located. This district must not be confounded with the Oro Fino district, as it is 15 miles north from Oro Fino to Zosel.

IDAHO.

THE COTTONWOOD MINES.—Idaho Avalanche, Aug. 29: The success made in working the ores of the Flint district has brought into notice the prospects lying some four miles north of Flint, known as the Cottonwoods. Twenty-five years ago some claims were taken up in this neighborhood, and from two of them at least some very rich ore was shipped, ore shipment from a small shaft fetching \$3000 per ton. But little work was done on any of the claims, and with the going down of Flint for the first time the claims were all abandoned. Mr. Wm. Quayle, who lives there, some four years ago took up four of the best claims, and has since kept them represented. In doing the assessment work he has accumulated several tons of ore on the dumps. This ore shows the character of the ore to be almost identical with the Flint ores, though so far probably not so high grade. The district is apparently limited in extent almost to the claims owned by Mr. Quayle, the granite showing through the porphyry for only a few hundred feet in width and less than a mile in length.

RUTH.—All three tunnels are being pushed ahead, the middle tunnel being in something over 600 feet, most of the distance in good milling ore.

STORMY HILL.—The lower south drift on this mine is now in something over 150 feet, all in good milling ore, and the north drift at this level is in about 100 feet; most of the distance is milling ore.

LAST CHANCE MINE.—This mine at Flint is producing the richest ore at present mined in Owyhee. Average samples of the shipping ore assay over 2000 ounces of silver per ton, while the concentrating ore now being hauled to the mill averages about 60 ounces of silver per ton.

FLINT COUNTY MINES.—The mill is running on Last Chance ore and doing splendid work, the concentrates assaying upward of 800 ounces silver per ton. A force of nearly 25 men are at work in the mines, getting them in shape for a large production of ore the coming year.

TRADE DOLLAR.—This property still continues yielding rich ore, and looks finely in all the workings.

POORMAN.—The drift recently started from Tunnel No. 3, on the Illinois Central vein, has opened up a large streak of good ore. The crosscut from tunnel No. 3 west to cut the Glenbrook vein is still in hard rock, which is supposed to be the hanging-wall of the Glenbrook vein. The main drift on the Poorman vein still holds out in good ore. A large amount of rich ore is now in the ore-house ready for the mill.

OREGON.

THE SANTIAM MINES.—Albany Herald Disseminator, Aug. 27: Pansan specifications of the Albany M. & M. Co.'s new quartz mill, which was shipped on the steamship Willamette Valley and arrived at Yaquina Monday, are to be seen in the office of the secretary, J. V. Pipe, in this city. It is a complete plant, and will cost when ready for work in the mines between \$25,000 and \$30,000. It is a ten-stamp mill, each stamp weighing 850 pounds, and its capacity is 30 tons per day. The mill and machinery will go direct to Gatesville, and from there will be hauled to the mines on wagons, the contract having been let to B. M. Huston & Co., of this city. The company already has a small mill and retort, and a sawmill, driven by a 40-horse power engine, now in operation at the mines. It will require about a month to get the new mill into the mines. In the meantime the company is working three shifts of men night and day, running a lower tunnel in on the ledge. Thirty tons of ore that will be crushed in a day will be reduced to about three tons of concentrates, which will be shipped to the smelting works, probably to S. F., or the Linnton works. Other companies are ar-

ranging to put in machinery to work their mines in the same district. The Albay M. & M. Co., has erected a two-story boarding-house and has sawed over 100,000 feet of lumber for other buildings at the mines, so it can be readily seen that a thriving camp is already springing up in the Santiam district.

JOSEPHINE GALENA.—Rogue River Courier, Aug. 27: Messrs. Davidson and Bailey have discovered a splendid silver lode of Althouse creek, about 40 miles from this city. The galena carries lead and silver at the surface of the ground which will assay \$70 to the ton. As galena always gets richer as the lead is followed down, this is a splendid strike. They have mountains of iron and extensive copper fields. This galena is just what is needed as a flux for other minerals and the opportunity for a large smelter is a splendid one. The boys have four or five men at work on their new find, sinking a shaft. The ore will be shipped for the present to Tacoma or San Francisco for smelting.

UTAH

THE NEW LA PLATA MINES.—Cor. Park City Record, Aug. 29: Thinking that many of your readers might be interested in the new mining camp of La Plata, and being one of the victims myself, I will write you a brief summary of that camp as seen by myself. The camp is situated in Cache county, and is a good 40 miles from Ogden by the road now traveled. It can be reached by parties on horseback through the Middle Fork road at a distance of 25 miles, but this road is impassable for teams, and at the present time, the Weber County Court has a force of men at work putting it in good condition. La Plata contains a floating population of from 400 to 500 persons, and it is not nearly the place that some of the correspondents of the Ogden and Salt Lake papers would like to make it appear. There are about half a dozen log houses in the camp, and in the neighborhood of 50 or 60 tents, varying in size from the small "A" tent to the large hotel tent which is capable of accommodating from 40 to 50 persons. There are a number of good restaurants, and the hungry prospector can secure almost as good a meal at them as can be gotten at some of the best hotels in the Territory and at just as reasonable prices. Provisions of all kinds, fruits and vegetables are to be had in abundance and at prices that will discount the Park City market. Town lots can be purchased at a mere nominal figure, but no title or promise of title will be given by the claim owners who sell them. The claims that make any showing are the La Plata, the Sundown and the Mountain View, better known as the Wardleigh. There are five or six other claims that look well, but none with the showing that the above named have. These claims are all lying in a line formation, said by many to be similar to that of Tintic, but have not been worked to any extent to speak of. The La Plata has a force of men at work sinking, but up to the time of my leaving camp, the developments had not improved the claim to any extent. The Sundown was not being worked at all, but the owners had sacked a little ore and claimed that they were going to put on a force of men immediately. These parties seem to want to make a sale, but don't hardly know what to ask for their ground. There are from six to seven feet of fine galena ore in sight, lying on a body of gray carbonates. The galena assays from four and one-half to six ounces silver and from 60 to 83 per cent lead. The appearance of the ore would indicate that it also contains some antimony. The carbonate ore had not been assayed that I know of, but it is apparently not a very rich ore. This claim is one of the best looking in the camp. The Mountain View claim is about one and one-half miles from camp, and also has a fine showing of galena ore. It is being worked by the two owners at present, and gives promise of opening up into a good mine. The only other claims that are anyway promising are two owned principally by an Ogden man named Heller, who has a goodly force at work on them and is doing more development work than is being done on all the other claims. The showing on this ground is very good, and the indications point to the opening up of a rich copper lode, as the vein matter is heavily copper stained and the vein quartz contains a large amount of native and gray copper. The balance of the claims are principally locations, with no indications but the discovery and end lode stakes on them, no work of any kind being done. There are from 100 to 200 people arriving in and leaving the camp daily, most of whom carry with them a very poor impression of the country on account of not looking over it properly. The camp will undoubtedly prove a good one if development work is carried on in good shape, and may, if prospected thoroughly and intelligently, prove to contain some fine mines. But at the present time the indications are that the excitement will die out until spring, when all parties concerned there will have cooled down, and not expect to realize immense fortunes or wait the earth for a few gopher holes in the ground, containing a small amount of almost pure lead ore.

WASHINGTON.

MENASTASH GOLD.—Ellensburg Capital, Aug. 21: Our streets have not been so lively in 15 months as they have within the past week, and the change is entirely due to the mines. Strangers are numerous in town, and nearly all are bound for the Menastash, or else seeking information in regard to the mines there. Several parties have returned from the mineral region this week, and all are well satisfied with the prospects. It is free-milling ore and nearly all gold. Many of the ledges are from 40 to 150 feet between the walls. Locations are constantly being made. If the veins go down in a satisfactory manner, the future of the mines is assured, and if this can be demonstrated before snow flies, a great work will have been accomplished. The reports from the Swauk continue good. C. J. Best, the assayer, last week refuted the result of eight hours work by two men with hand mortars on Williams creek, and the result was \$153.80, the gold being 21 fine. The Swauk miners feel greatly encouraged over their outlook, and consider the lack of a mill their only drawback. Every effort is being made to secure one, and it is believed one will be on the creek before long. The citizens of Ellensburg are encouraging the development of the mines with wonderful unanimity.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 25, 1891.

- 458,330.—FIRE-CHAMBER VENTILATOR—P. Abrahamson, S. F.
- 458,151.—CUTTER BAR ATTACHMENT—Baker & Lacey, Bakersfield, Cal.
- 458,441.—SQUARE FOR RAFTER AND STAIR WORK—W. H. Bast, Olinda, Cal.
- 458,335.—HARVESTER—N. L. Darling, Benicia, Cal.
- 458,248.—FARM GATE—A. L. Gericke, Sonoma.
- 458,453.—PACKING EXTRACTOR—A. Goodrich, Astoria, Ogn.
- 458,249.—ELECTRIC POWER BRAKE—C. V. Greenmyer, S. F.
- 458,455.—WHEEL ROAD SCRAPER—A. Harpold, Colton, Cal.
- 458,326.—GLOVE—H. L. Heath, S. F.
- 458,422.—FRUIT-GRADING MACHINE—Jas. T. Ish, S. F.
- 458,170.—QUARTZ-MILL—D. B. James, S. F.
- 458,327.—FLOUR PACKER—M. W. Lipe, San Jose, Cal.
- 458,536.—ELECTRIC UTERINE SUPPORTER—G. F. Mohr, Los Angeles, Cal.
- 458,328.—VAPOR-FORMING ATTACHMENT FOR GRATES—M. Noble, S. F.
- 458,329.—PNEUMATIC GUN—J. R. N. Owen, Eureka, Nev.

The following brief list by telegraph, for Sept. 1, will appear more complete on receipt of mail advices: California—John H. Bonthe, Hollister, tug hook John G. Enke, Los Angeles, apparatus for raising sunken vessels; George Farthing, San Jose, preparing skins; George B. Ha-nell and M. S. Gill, San Francisco, grip for cable cars; James E. Kintzold, Oakland, purifier of steam boilers; M. H. Lawe, Mariposa, many surfaces blackboard; William A. Madden, Madera, lumber clump; Emil F. Moennig and K. A. Haescl, San Francisco, safety device for elevators; Manuel S. Pres, Contra Costa, windmill; William T. Rutherford and A. J. Roberson, Napa, pillow-sham holder; William H. Siebecker, San Francisco, car truck; Borden W. Taylor, Los Angeles, feed water heater; Hiram P. Willard, Tustin, and Ferdinand E. Wood, San Jacinto, table; A. A. Charonnet, Nevada City, variable nozzle; David E. Durye and A. Beggs, Seattle, bearing machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PNEUMATIC GUN.—Joseph R. N. Owen, Eureka, Nev. No. 458,329. Dated Aug. 25, 1891. The inventor relates to that class of guns designed to throw, by means of compressed air or gas, shells charged with dynamite or other sensitive high explosives. The object of the invention may be generally stated to be the provision of a gun of this class, which, on account of its construction and the principle upon which it operates, will fire its projectile or shell effectively and with safety both to the gun and to those serving it. Instead of seating the projectile within the reinforce and back near the breech, as usual, and leaving a long extent of bore to be traversed before it leaves the gun, Mr. Owen seats it within the chase of the gun and as near to the muzzle as practicable. All that part of the bore behind it is to serve as a chamber to accommodate and hold the charge of compressed air or gas which is to throw it. The projectile is held in its seat by mechanism outside the muzzle of the gun, and after the chamber is charged with the gas or air under pressure, the latch at the muzzle may be freed by a lanyard, and the gun discharged.

FIRE-CHAMBER VENTILATOR.—Peter Abrahamson, S. F. No. 458,330. Dated Aug. 25, 1891. The objects of this invention are to provide means for supplying the fire-chamber with fresh air and to draw off from it the foul gases which accumulate within it. The invention is applicable to any furnace or fire-chamber, but is especially adapted for boiler furnaces. A proper feed of fresh air to the furnace is effected, and results in more perfect combustion and consequent economy in the consumption of fuel. By the peculiar location and direction of several passages, their dampers may be opened without allowing cold air to rush in, which differs from the effect of opening doors in either end of the furnace or chamber. The fresh air, in coming through the passages provided for it, becomes sufficiently heated to not only avoid retarding combustion, but even to assist it, which will effect an economy of fuel—a result gained the more perfectly by the purifying of the combustion chamber due to the expulsion of the foul gases, owing to the peculiar arrangement of the passages.

FLOUR-PACKER.—Milton W. Lipe, San Jose, No. 458,327. Dated Aug. 25, 1891. In filling sacks with grain, where the grain is discharged by a chute or otherwise into the sack, it is well known that unless the grain is tamped or shaken down while the sack is being filled, it will lie so loosely that the sack will not hold as much by a great many pounds as it will otherwise do. It is usual in filling sacks from threshing machines to use a stick or some such device for tamping the grain as it flows into the sack. This invention consists of an automatic device for doing this work, and in certain means for attaching and detaching the sacks so that the work may be continuous. The inventor states that he has found by the use of this device he can place 8 or 10 pounds more of grain in every sack than could be done with any of the hand-tamping that has previously been practiced.

GLOVE.—Heber L. Heath, S. F. No. 458,326. Dated Aug. 25, 1891. The object of this invention is to provide a glove which is especially useful for teamsters, stage and other drivers by taking all seams out of the front of the fore and middle fingers at the point where the reins pass and between these

fingers. It also provides an economy in the manufacture and saving in the stock. In the manufacture of heavy gloves and those used by drivers, it is especially desirable to make the space between the fingers through which the reins pass as clear as possible of seams, and with this object in view, this inventor has made a pattern in which, by a seam passing between the first and second fingers and points on each side of this seam, the longitudinal seams between these fingers are thrown entirely beyond the fingers. Only one fourchette is used, and altogether but four pieces in the formation of the glove.

HARVESTER.—Naaman L. Darling, Benicia, assignor of one-third to J. R. Dixon, Los Angeles. No. 458,335. Dated Aug. 25, 1891. This patent covers certain improvements in that class of traveling harvesters in which the grain is cut, thrashed, cleaned and sacked ready for market at a single operation, and while the machine is traveling about the field. It consists essentially of two frames hinged together side by side, and supported upon suitable bearing and traction wheels. The engine which propels the machine over the ground, and which also furnishes power to operate the cutting, thrashing and cleaning devices, and also the intermediate carrying belts, is mounted upon one of these frames. The thrashing and cleaning mechanism is mounted upon the other, and the header and extends across the entire front of them. The rear ends of the two parallel main frames are supported upon a peculiarly constructed steering frame and wheels, which support the main frame and allow them freedom of movement about their hinge joints. By a peculiar arrangement of hinges between the header frame and the two main frames, they are all connected without interfering with the movements of the main frames, and by the same devices a sufficiently flexible connection of the various conveying belts is provided for.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 3, 1891.

Many dealers still complain of light trade, but taking all as a whole, there can be no doubt but the volume of goods going out is above the average at this season of the year. Continued building of railroads on this coast gives improved transportation facilities, and does away with the necessity of interior merchants carrying large lines of goods. To this is to be attributed the seeming dullness in some branches of trade. Among iron workers, business is reported good, and orders ahead by several firms. The lower prices ruling for iron and coal are largely in their favor. The money market is easy, with the tendency to still greater ease. Remittances from the interior are setting in more freely. In the speculation markets wheat continues the attraction, although railroad and other securities are coming to the front. Speculation in mining shares is expected to set in before long. When a speculation craze does set in, there is no telling when or where it will end.

MEXICAN DOLLARS.—The market is dull but fairly steady around 77½ cents. Some importers are firm at a slight advance.

QUICKSILVER.—Receipts the past week aggregate 160 flasks. The market is reported steady.

SILVER.—The market closed the month of August dull and heavy, entering September with the Government buying at a slight advance. The very low prices ruling in this country, and also in Europe, is an anomaly, and yet we still believe that much higher prices will be seen before the year closes. There are those in this country who think that mining share manipulation has something to do with it, for it has been noticed that when these securities went up silver went down, or else hung heavy, but with shares going down the metal went up. Whether this is a coincidence or not we are not prepared to say, but still the movements of the two have been in opposite directions. Russia is to issue, so says telegraphic advice, 50,000,000 paper rubles against the silver held by the Government. If this proves to be correct, then Russia's holdings are out of the way.

BORAX.—Receipts the past week aggregate 225 cts. The market is said to be steadier. In Eastern Washington a rich deposit has been found, which it is contemplated to work.

LIME.—Receipts the past week aggregate 2658 bbls. The market is firm under a good demand.

TIN.—1075 boxes plate were received the past week by railroad from New York. The market is dull but steady for plate, and easy for pig. English advices report small orders for plate from this side. The stock here and at the East is large, much of which is held for next season.

LEAD.—The market does not exhibit any change worthy of special mention.

COPPER.—Contrary to expectation in many quarters, the market not only did not go below \$12 for Lake, but has made a slight advance. London cables report that "the future of prices appears to depend greatly upon American supplies, which have recently been larger than expected. Any lessening supply from that quarter would probably strengthen the market. Demand from consumers is moderate."

IRON.—The market is in buyers' favor, under fair stocks here and large consignments afloat for this port. The coosumption is large, both here and up North.

COAL.—Imports the past week aggregate 16,587 tons, distributed as follows: From Departure Bay 4,850 tons, Seattle 2,304, New York 272, Liverpool 3,220, Tacoma 2,000, Nanaimo 2,484, Coos Bay 1,175. The market is barely steady for cargoes in all positions. Steady additions are reported to the coal fleet from Australia. The high charters ruling here for wheat are drawing coal vessels to us. Several large consumers are not anticipating their full requirements for they believe that many vessels will come coal laden, whose cargoes will have to come on an open market after arrival. It is only by concessions they are tempted to buy for wants from three to four months ahead.

Mining Share Market.

Mining shares the past week were dull and heavy. Under a prearranged concert of action, the pool through cross orders succeeded in quoting the Gold Hill stocks, together with Potosi and Bullion, at lower prices. This was done so as to uncover several lines of stocks carried on a margin. So far as we can learn, they have not brought these stocks down to as low a point as they contemplated, and therefore outside dealers had better be careful about overbuying. The trouble with the latter is they are too hoggish, and in trying to get too much, they come out in the end with comparatively nothing. The fact must not be lost sight of that the mines are in too good condition to let outsiders have the stock to any great extent, and the old freeze-out and scare-out games are being resorted to; but those who have the courage to hold on and not be frightened, or frozen out, will, it is claimed by well-informed miners, come out considerably ahead. The water in the Gold Hill mines, it is said, could have been, if desired, pumped out long ago; but had this been done, there would be no plausible excuse for levying assessments and also making her raids to frighten holders. In well-informed circles, it is asserted that in Yellow Jacket they uncovered in running west very high-grade ore, and its continuation was found in Crown Point. Of course, the bear movements in the market have been to get stock better concentrated. In Overman, we have not heard of their crushing the ore going from \$50 to about \$100 a ton, which was officially reported last year. If it was taken out and milled there, the returns do not show it. In this mine, as in several others of the Gold Hill mines, very rich ore is known to exist on the lower levels, and as the water in the mines will be out before the close of the year, there does not appear to exist any excuse, unless it be to loot the mines for not showing it up. In the west workings of Confidence, Challenge, Con. Imperial and Alpha, rich ore—gold-bearing—is known to exist. It is said that several of the upper levels have been more or less looted, but the lower levels, it is claimed, have not been.

The officials of these mines may possibly get themselves into as bad a fix, as is said by many persons who ought to know, as are the officials in one or more of the Middle mines. It is a dangerous experiment by mine trustees not to keep well informed on the working of the mines they are elected to look after. Ignorance is no excuse in law.

It is to be regretted that the papers noticing Col. Mackey's movements so as to give color to the movements of the stock market, did not state that it is said when he had a toothache, and not having anything convenient to knock in his paroxysm of pain, knocked the Gold Hill stocks.

A subscriber to the PRESS sends us a communication in which he says: In the interest of that much-abused race, Russian Jews, and to relieve the Czar of further trouble in the matter, I beg leave to suggest through your columns that they be sent to California and placed on the pay-rolls of the Savage and Hale and Norcross mines.

We are informed by good authority that a person with ample means is prepared to enter into an agreement with the Comstock mines to reduce their ores (which includes transportation charges) at \$4 a ton, and return 80 per cent of their assay value, provided the mines will agree to furnish enough ore to keep the mills which he will have, running.

The market opened this (Thursday) morning inactive. After its regular call there was no change to report. Those in position to know say the pool is taking in stock, yet they believe still lower prices will come before any decided up movement sets in.

From the Comstock mines our advices report that nothing much is expected to result from the west drift now being run in Sierra Nevada, but when west work is resumed, on or about the 1400-foot level, high-grade ore will be uncovered. In Union, Mexican and Ophir, rich ore can be shown up at any time, but the pool is killing time so far as work is concerned. The work reported in Cons. Virginia does not indicate that the high-grade ore reported by Patton in the last year of his superintendency is to be shown up. He reported that in the lateral or marginal drift the ore extended from Ophir to Best and Belcher, and that it was from 12 to 18 feet wide. Private but reliable advices are very sanguine about the work in Savage and Hale and Norcross, and that they can, at any time desired, show up very rich ore on several levels. Of course, if the share market was high, we would not believe all that is reported, although coming from undoubted sources, but as prices for many shares are about as low as they usually get, more credence is given them.

In outside mines the work going on is interesting, particularly in the Bodies. It is claimed that after they are assessed, these shares will do much better. It is said that the Iowa mine claim was relocated in May, 1890, under another name, by Mr. Steel of the West Cons. Virginia mine.

IMPROVED KNIGHT WHEEL.—Knight & Co. are out with another improvement upon their excellent water-wheel. They have got a wheel, four feet eight inches in diameter, which will develop 100 horse-power with 2500 cubic feet of water per minute under a head of 27 feet. This is the best result so far achieved by any wheel. The improvement is owing to a circular nozzle which encircles one-half the wheel, and a widening of the buckets. The wheel is to be shipped in a few days to a mine in Yreka, Siskiyou county.—Amador Ledger.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE NAME ON YOUR PAPER.

The report of the discovery of the Lost Ohio mine, on the shore of Klamath lake, Oregon, turns out to be a "fake." That mine has been rediscovered scores of times on the same basis.

MECHANICAL PROGRESS.

American Workingmen.

Sir James Kilson, in a recent communication in the *Contemporary Review*, gives the following opinion of American workingmen and their "hosses" from an English standpoint: "Every one agreed that the American skilled artisan puts forth more physical effort and produces more work in a given time than the English workman, or the workman of any other manufacturing community. This fact struck me and many experienced directors of works most forcibly. Before concluding our tour I had the opportunity of verifying and strengthening this first impression. After watching the American workmen at Pittsburgh and elsewhere, I arrived at the same conclusion as to their efficiency. Their productive power is greater than that of the English workers in the same time, and their working hours are longer and their remuneration greater. I met one of my old workmen at Mr. Carnegie's works in Pittsburgh and he endorsed my opinion, speaking from his own practical experience.

"I am quite a different man here," he said, "from what I was in the old country. I don't know why it is so; whether it is that I live in a stimulating atmosphere or whether it is the example set me; but I know I have got the go in me here. I can do more work; I feel that I have it in me; but I also feel and know that it won't last. I shall be done in ten years."

No, it won't last. The extreme physical effort puts forth results in greater production, but it saps the vital energies and cuts short the career. This continual work at high pressure does not pay in the end. "It won't last," and the remark applies with equal force to the employers as well as to the workers. Competition between manufacturers is keener than in this country. They work their business at high pressure. There is a terrible struggle between them for the possession of the markets. They put forth their utmost energies, and when they succeed their reward is great; but all cannot be the leaders in industry. This fierce competition reacts on the men. We were surprised to find in a democratic country like America, that the workmen had so little power and were to such a large extent the docile instruments of energetic employers. The "hosses" have the faculty of "driving" the men and getting the maximum amount of work out of them, and the men do not seem to have the inclination or power to resist the pressure.

Cast Iron—It is a Child of the Dim Past.

Few quotations occur more frequently than "There is no new thing under the sun." All admit its force with regard to abstract thought and to political organization. We are, however, says a contemporary, disposed to flatter ourselves on our advance in mechanical science. Even here, however, the relentless antiquarian is continually showing us that we build on ancient foundations. Great ideas existed for centuries past, even though it has been reserved for modern times to carry them into effect. That the Hebrews, Greeks and Romans had some idea of the value of iron is universally known. About half a century ago metallurgical students declared that, ancient as metal weapons might be, cast iron was a distinctively modern product. This, as far as Europe is concerned, may be true, cast iron statistics going back no farther than the latter part of the fourteenth century. After prolonged study, the late Dr. Gurlt, of Bonn, concluded that cast iron is a child of the dim past. In China, wrought iron and steel were known 2,000 B. C., and cast iron about 400 B. C. A Chinese author describes the process at length.

In the first century of the Christian era, a Chinese ravine, 1,000 feet deep, was spanned by a compressed bridge with cast iron columns. Cast iron is mentioned by Aristotle and Pliny. The Greeks and Romans do not, however, seem to have used it extensively, judging from the fact that while wrought iron relics are common, cast iron relics are rare. Dr. Gurlt is none the less convinced that investigation will disclose many more such relics. He describes a little statue, representing a priestess of Isis, or the goddess Isis herself, which he supposes to have been made by an Egyptian craftsman or under Greek-Roman influence. Cast iron has also been found in parts of Moravia where the ancient Celts mined, under the direction of their German conquerors. Hitherto the men who have made archaeological researches, have generally been governed by a desire to obtain historical or literary information. The industrial treasures of antiquity are comparatively little known. It is likely that much more will be found.

ROLLING-MILL IMPROVEMENT.—A most notable and valuable improvement has been made in rolling-mills adapted for structural iron or steel, and particularly beams which are I-shaped in cross-section. Such beams are used now by the thousand, being the most serviceable form for general structure. This form of beam is, by ordinary rolling-mills, hard to form perfectly in very large sizes, and its production is attended with great disadvantage. Large beams of this class are therefore built of straight web sheets, with angle iron riveted on to give lateral strength. By the present improvement the beams can be made of any size and in

perfect finish, with great facility and results, both in speed and quality attained, hitherto unthought of. The novel and conspicuous feature of the implement consists in the management of a pair of rolls rotating in a horizontal plane on vertical shafts, these rolls being journaled in such contiguity to the horizontal rolls that their peripheries all turn in to form the transverse outline of an I beam. In this arrangement the horizontally rotating rolls form the top and bottom faces of the I, while the web faces are formed by the horizontal rolls. The housings of the horizontally rotating rolls are arranged for lateral adjustment, being movable along slide-ways and adjusted by screws. The arrangement is most admirably effected without interfering with the bearing of the horizontal rolls, yet securing perfect concurrence of action at a common point of compression, and subjecting the entire surface to a clean, clear action. The mill is a marvel of compactness and power, no improvement seeming possible. Mr. J. Reichmann, of Chicago, Ill., owns the patent.

WHY DOES SOLID IRON FLOAT ON MOLTEN IRON?—This question, which has puzzled a good many observers, was satisfactorily explained by Dr. Anderson, in a recent paper on steel, read before the Iron Institute, London. When a piece of solid iron is thrown into a pot of molten iron or steel, the solid metal at first sinks, which shows that its volume is less than the melted metal; but soon the solid piece becomes heated, which causes it to expand. Its volume is increased, and it rises and floats on the surface of the molten mass. The action is the same both with iron and steel. Mr. Wrightson said: "The experiment was frequently made by throwing a piece of iron into melted steel. They could see it go down, and might think that it was on account of the impetus which the iron had attained in falling that height, but as a matter of fact, if the iron were put upon a fork and lowered, it would go down; but in the course of a few seconds it came up again, and kept on expanding until the piece of iron was a considerable distance above the surface of the metal; then it decreased in volume, and of course became of the same volume as the molten metal which it joined. Any one could see by the distance that the piece of iron went above the surface that it was of considerably less density than the molten metal."

THE LARGEST ARMOR PLATE INgot ever cast in this country was recently turned out at the works of Carnegie & Co. near Pittsburgh. The ingot was 80 inches wide and 23 inches thick, weighing 32,000 pounds. It was cast in a sand mold for a test, and the material proved much superior to that tested in a metal mold. Heretofore there has been a great deal of trouble in casting in metal molds, owing to the many flaws. An ingot cast in the sand mold was found not to contain a single flaw. It is more than likely that hereafter sand molds for turning out armor-plate ingots will be adopted. Sand is universally acknowledged to be the best material for molds in which to cast iron. Iron or other metallic molds chill the iron, and it does not fill well. The great heat at which iron melts burns any other material, or it will stick so as to break the mold. The success of this experiment on so large a scale is considered an important advance in heavy foundry work.

AMERICAN SCREWS IN ENGLAND.—London Iron is authority for saying that the American Screw Co. of Providence, R. I., has made arrangements for the establishment of a large factory at Leeds, England, for turning out the class of screws which has heretofore been manufactured only at their works in Providence. The demand for these screws has become so great in England that the above move has been considered imperative. The machinery for the factory will come from this country, and be adapted to the requirements of English joiners and manufacturers. The finished wire used in the manufacture of the screws will at the start be obtained elsewhere; but the scheme of the company includes the construction of wire mills and annealing furnaces alongside the screw factory.

A BURGLAR'S OUTFIT.—It is said that a thorough outfit for a burglar's kit embraces over 100 tools and processes, the most of which are marvels of ingenuity and scientific knowledge. The police of New York recently captured an outfit which consisted of a little giant knob-breaker, a diamond drill and a high explosive of the nature of dynamite, but put up in the form of a powder. It would open the strongest safe in a half hour, and without noise enough to disturb the people in the next house, while the entire outfit could be carried in the pocket of an ordinary coat.

A NEW USE OF ANTI-FRICTION BALLS.—In a new bicycle tyre the wheels, instead of being fitted with pneumatic or cushion tyres, have the grooves fitted with a complete cycle of balls, which revolve on pivots fixed in the groove of the wheels. These balls bite the ground, and the machine travels up or down hill with wonderful celerity and ease.

PAPIER MACHE oil cans which are now being made are very durable, and impervious to any spirit or oil likely to be used in a machine room.

A NEW RIVET in the form of a tube, to be used both as a rivet and as a drainage way, is the wrinkle to iron shipbuilding.

SCIENTIFIC PROGRESS.

Artificial Rain-Making.

It is reported that the Government experiments now in progress in Texas have been partially successful in the efforts to produce rain artificially. Repeated explosions were made high in the air on Monday August 10th. About ten hours later heavy clouds gathered and rain soon fell over many miles of surface; but the experimenters do not feel perfectly assured that the explosions were direct agents in producing the clouds. They merely claim that they were instrumental in precipitating the moisture from the clouds, and greatly increased the intensity and extent of the storm. The experiments will be continued until satisfactory conclusions can be drawn therefrom. The explosive used was gun powder; but we presume other kinds of explosives will be used as the experiments proceed. The final result is looked for with much interest.

The Possibility of Producing Rain

By concussion, from a cloud already fully saturated with moisture, is thought by nearly all scientists as a reasonable probability; but what is so ardently desired and really sought for by those who are advocating these experiments, is the production of rain from an area of dry atmosphere. This matter is discussed at considerable length in the following communication, which has been received the past week:

EDITORS PRESS:—If the following article in relation to causing a rain storm by the explosion of certain compounds in the atmosphere, is of sufficient interest for a place in your valuable journal, please insert it.

Various writers have recently given an explanation for this phenomenon, by stating that the fall of rain under such circumstances was an effect of concussion, but not one of them has explained why rain should be produced as an effect of such atmospheric concussion, or of the operation of any natural law that could produce it. For such reasons we incline to the opinion, that rain under such circumstances is not the effect of concussion. The fact has been observed that in many instances rain has followed heavy cannonading, and for this reason it has been taken for granted that it was produced by atmospheric concussion, that is that the concussion produced by one explosion of certain compounds, has the effect to cause a condensation of the vapors held in suspension in the atmosphere and of falling in the form of rain, but by what law the condensation of vapor can be produced by concussion, as I before mentioned, has never been explained.

Now what is understood as condensation, is the uniting or bringing together the particles of vapor into such a mass or quantity, that by gravity they are caused to fall in the form of rain. For instance in the steam engine, the water of the boiler by the means of heat is converted into steam or vapor, but in order for such steam to be of practical value, it must again be restored to its original condition or in other words condensed, which is accomplished by being suddenly cooled, the particles of vapor are thereby caused to unite and the steam is thus transformed to its original condition of water. But I do not believe that an instance was ever known of its having been accomplished simply by concussion.

In order however to understand the nature of the forces in operation which may possibly cause the fall of rain by the explosion of certain compounds, it is necessary to understand the nature of air and of water or of the elements of which they are composed. Chemistry teaches us that water is composed of the two gases oxygen and hydrogen chemically united in certain proportions and that under no circumstances can water be produced by a combination of these two gases, excepting when they are chemically united and in the proper proportion. The fact that the atmosphere is a simple mixture, merely of the two gases, oxygen and nitrogen, and not a chemical compound is the reason why the hydrogen gas set free by an explosion is enabled to form a chemical combination with the oxygen of the atmosphere.

Now experiments by chemists have demonstrated the fact that when oxygen and hydrogen are mixed in the proper proportion and exposed to great heat, either by the combustion of certain substances or by the electric spark, these gases, by the operation of a mysterious law, will unite, and water will be produced as the effect of such combination. It is in the operation of this mysterious law that enables us to form some idea of the nature of the phenomenon in question or why rain should be caused to fall by the explosion of certain compounds in the air above.

For instance, if certain substances which contain in their composition a sufficient quantity of hydrogen gas are caused to explode in the air above, this gas is set free, and in consequence of the great heat produced by the explosion, a combination of the oxygen in the atmosphere with the hydrogen thus set free is effected, and in accordance with the natural law governing these two gases, water is pro-

duced, and by gravity falls in the form of rain.

This, however, is not a new discovery, since Priestly long ago made known the important fact that, although water was composed of the two gases oxygen and hydrogen, yet they would only unite under certain conditions, viz., either by combustion or by the electric spark.

The reasons for this are as yet little understood, although it may be due to the fact that, in order to form a compound of two or more elements, or, in other words, a combination of them, it is necessary that the atoms which compose them must bear a certain ratio in their motions, and since it is evident that the atomic motions of oxygen are much greater than those of hydrogen, it therefore becomes necessary, in order to form a combination of them, that the atoms of the latter should receive an accelerated velocity corresponding to the former; hence arises the necessity of an explosion for the purpose.

We are further informed that rain cannot be produced by such explosive compounds in a dry atmosphere; but if the phenomenon of rain is not the effect of concussion, but is due to the combination of the above-mentioned gases only, it is evident that rain can be produced in a dry atmosphere as well as in one saturated with moisture.

Although, as before mentioned, the fact that water could be produced by an explosion was discovered many years ago, yet the process is new in its application, and, under the proper conditions, may no doubt be made very serviceable and of great value to suffering humanity upon portions of the earth's surface where severe and protracted drouths are the rule.—C. W. HASKINS, Oakland, Aug. 15.

The above communication expresses the opinion that mere explosions, designed to produce concussions only, will not cause rain; but that explosives containing mixtures which will liberate large quantities of hydrogen gas will, by a union of the hydrogen thus liberated, with the oxygen of the atmosphere, produce a quantity of moisture which will form a "nucleus" for the concentration of a much larger quantity of moisture which is always present in the atmosphere, even in its driest condition, and thus rain will follow. But when we bear in mind the fact that there is no substance known which can be elevated in any practicable quantity to any considerable height, and exploded so as to produce more than say two cubic feet of water, the "nucleus" cannot be very great or widespread in its influence. Still, as in these wonderful days of scientific progress and investigation it is dangerous to pronounce anything an impossibility, we must regard even this rain-producing theory as a matter that should be thoroughly studied and experimented upon, all unscientific and improbable as it appears to be.

THINKING A HOLE THROUGH A BOARD!—As is remarked by the *Industrial Herald*, "wonders will never cease in this progressive age." New illustrations of this remark are constantly coming to notice in almost every department of research and industry. It is only a few days since the *Electrical Review* of New York made the announcement that "Here, in New York, within a few weeks, we have seen pictures of sounds and have heard the sound of colors!" A new and still more startling announcement has recently been reported and brought to light by the performance of a celebrated electrician, who, having stated that he could "think a hole through an inch board," and was hooted at for so doing, connected a drill so that it could be actuated by the current produced by "the heat of thinking," and actually did what he asserted, so it is said. Later reports state that he was not the first to try the experiment, which was carried out more than 20 years ago by Dr. Lombard of Harvard College. The mental effort involved in the acquirement of important branches of learning is now to be measured by this means. A delicate astatic galvanometer needle is connected with a thermopile, which is placed close to the head, and every change in the temperature of the skull is faithfully recorded by the galvanometer needle, thus enabling the measurement of thought by means of the heat developed within the brain acting upon the thermopile.

A PROUD PROPHET.—A contemporary very truthfully says: No prophet beholding the overthrow of a city, which he had predicted, was prouder than Lieutenant Finley, who foretold almost to a minute the overthrow and annihilation of the late hot wave, which came down like a wolf on the fold from the torrid, treeless region of Southern Oregon. Saturday morning, Aug. 22d, Lieutenant Finley said that the warm wave would continue over Northern California until noon Sunday, when it would be followed by decidedly cooler weather and fog in the evening. He gave as a reason for his forecast the appearance of a cyclonic disturbance, moving eastward from Vancouver island, which would cause a decided fall in the barometer over Washington and Nevada, and it was even so.

THE CAMERA IN SURVEYING.—The Surveyor-General of Canada, Mr. Deville, has adopted a novel method of surveying in the Rocky mountain region of the Dominion. It is to photograph the country by a specially designed camera. He considers the photographs as accurate as a plan laid down by means of a protractor.

GOOD HEALTH.

CRAMPS IN THE LEG.—Many persons of both sexes are greatly troubled with cramps in one or both their legs. It comes on suddenly and is very severe. Most people jump out of bed (it nearly always comes on either just after going to bed or while undressing) and ask some one to rub the leg. I have known it to last for hours, till in despair they would send for the family physician; and even then it would be hours before the spasm would let up. There is nothing easier than to make the spasm let go its hold, and it can be accomplished without sending for a doctor, who may be tired and in need of a good night's rest. When I have a patient who is subject to cramp, I always advise him to provide himself with a good strong cord. A long garter will do if nothing else is handy. When the cramp comes on, take the cord, wind it around the leg over the place that is cramped, and take an end in each hand and give it a sharp pull—one that will hurt a little. Instantly the cramp will let up and the sufferer can go to bed assured it will not come on again that night.—*Dr. St. Clair.*

CRAZED BY MOSQUITO BITES.—Alexander Gordon, a fancy goods dealer at Elizabeth, N. J., became a raving maniac from loss of sleep caused by the tortures he endured from mosquito bites, combined with the intense heat. He ran along Broad street, dressed only in a pair of trousers, and terrified pedestrians by his wild actions, climbed over barbed wire fences on Spring street, and raced through yards yelling like a demon. When finally captured at last by the police, he tore off the only garments he had on, and it was necessary to wrap a rubber blanket around him to get him to the County Jail, where he had to be put in a strait-jacket. It is said his blood has been poisoned by New Jersey's venomous pests.—*N. Y. Commercial.*

A TOOTHPLICK IN THE THROAT.—John J. Ramsey of Newport, Ky., met with a peculiar accident recently. He had just finished eating supper, and had a wooden toothpick in his mouth. He laughed at some remark, and the toothpick, which was short, slipped into his throat. It lodged in his windpipe. All efforts to dislodge it proved unsuccessful. The following night he underwent a surgical operation, and the obstinate bit of wood was removed. Too much care cannot be used when putting foreign substances in the mouth.

WHY ARE FARMERS STIFF JOINTED?—Old farmers grow stiff-jointed and bent, not by hard work so much as by the utter neglect which most of them give to the rules of hygiene. Too little attention is paid to health matters by people in general. By proper study and care, the average of human life might be extended to one-third more than it now is.

DANGER FROM SNEEZING.—The physicians at South Charleston, Ohio, are baffled by the case of a girl who is literally sneezing herself to death. She seems to be the victim of some strange nervous affliction, together with hay fever and with the lingering effects of a severe case of the grip, with which she was afflicted last winter.

DANGER FROM A WASP'S STING.—A Soranton (Pa.) boy is in a critical condition and may die as the result of being stung by a wasp on the hand. His arm up as far as the elbow is swollen to twice its natural size. Should the swelling extend to the body, which is probable, death will ensue.

FOR TENDER FEET. take two quarts of cold water and add one tablespoon of bay rum and two tablespoonfuls of ammonia. The feet should be soaked in this for ten minutes, throwing the water upward to the knees. Rub dry with a crash towel, and the tired feeling will be gone.

DEATH FROM A FLY BITE.—A fly caused the death of a man at Vienna. He was walking when the insect suddenly took a position on his forehead. As soon as it left, a swelling appeared, and the man soon afterward died of blood-poisoning.

ON WHICH SIDE TO SLEEP.—A medical writer says that at least nine men out of every ten sleep on their right side, because by so doing digestion is aided and the action of the heart is left undisturbed.

VEGETABLES FOR STRENGTH.—Most of the operatives at the Rembrandt Iron Works at London who have anything to do with the heaviest work subsist principally on vegetables.

FOR A BOIL.—The skin of a boiled egg is said to be a good remedy for a boil. Carefully peel it, wet and apply to the boil. It draws out the matter and relieves soreness.

CURIOUS CAUSE OF SEASICKNESS.—It is said that old sailors are made searick by the excessive amount of vibration caused by the propellers of some of the high-speed cruisers.

HUMAN LIFE.—A scientist says the average term of human life has increased in the last 50 years from 34 to 42 years.

THE WATCHMAKER.

EVERY DECADE HAS ITS FASHION.—Only 20 years ago it was the ambition of the ordinary mechanic with good wages to own a gold watch. I am not so old but that I can remember that in those days the possession of a gold watch by a wage-earner was a distinction, and the owner was looked upon as a more than prosperous fellow. A decade or so farther back there were few people, not of independent income, who thought it seemly to appear with gold watches. Silver watches in those days were considered quite good enough for all practical purposes, and one didn't see a gold watch on the person of a wage-worker very often. Gradually, however, the gold watch became more frequent, and the silver watch wasn't so satisfactory as it had been. Then in a few years the gold watch grew almost common, until I can remember how a few years ago the silver watch was as uncommon as the gold watch had been ten years previously. Then it became so that if a man had a watch at all it was gold nearly always, and gold grew cheap. In the last few years a change of taste is becoming apparent. The gold watch is giving way, very slowly, to the silver watch, and one sees silver watches very often where they were really uncommon. And in jewelry of whatever kind silver is coming steadily in demand.—*The Jeweler's Review.*

A PROFESSIONAL CLOCK-WINDER.—Did you ever hear of a professional clock-winder? Well there is such a thing, and right in Boston. In the winter time his business is brisk, as at that season of the year almost all his customers keep open house. He remembers among his patrons many of the residents of the Back Bay district, most of them whom keep two or more clocks in their houses. Mr. Clock-winder goes about making his calls each day or week, as the case may require, attending to his subjects in such a way that no one is given false time or suffers on account of forgetting to wind his clock. The clock-winder's method is to examine each clock, wind it, set it, and if it is out of order or needs cleaning sees that it is put to rights. He keeps a record of each clock, when it was set last and the days for winding; in short, his book is a complete history of the good or evil doing of the clocks in his care. One thing he never forgets, and that is to send in his little bill each month. He has a large number of customers: and is adding several each week. The price he exacts is but a trifle. *Boston News.*

WATCH MAKING IN FRANCE.—It appears from a report made by the Besancon Chamber of Commerce on the operations of the French watch industry, that the anticipations formed in 1889, of an improving course of business were fully realized in 1890. Out of 404,436 watches of French manufacture delivered for consumption in 1890—of which about 30 per cent were gold and 70 per cent silver—no fewer than 401,439 were passed by the Besancon Control Office. Foreign watches to the number of 40,911 were passed, of which 8515 were gold and 32,396 silver. A comparison of the French watches with the foreign article shows that Besancon supplied 90.70 per cent of the general consumption in 1890, against 89.51 per cent in 1889, and 85.45 per cent in 1888.—*London Times.*

A RAILROAD ENGINEER'S CLOCK.—A new clock has been invented by a railroad engineer that promises to be a great advantage to locomotive engineers. The dial-plate and figures are large, and so are the hour and minute hands. As a train whirls by a station the hour and minute hands whirl round like a flash to mark the correct time, and a red bull's-eye flashes into the dial. Five minutes later the red light turns green, and in five minutes more the green light disappears. The engineer on the next train following can tell exactly how many minutes ahead is the train that precedes him. The clock is a perfect time-keeper, and when the train passes drops the signal light.

A MAMMOTH CLOCK.—A clock that might be safely stated to be the eighth wonder of the world is to be placed on the tower of a public building now erecting in Philadelphia. The center of the dial, which is 25 feet in diameter, is to be 35 feet above the street. The bell will weigh from 20,000 to 25,000 pounds, and its detonations will be distinguishable throughout the whole city. The minute and hour hands are to be 12 and 9 feet in length, respectively, and the Roman characters on the dial will be two feet eight inches long.

AN AMERICAN WATCHMAKER HAS JUST HIT UPON a contrivance by which, a couple of hours before a clock runs down, the words "Please wind me up" will appear at an opening in the dial.

A WATCH MANUFACTURER, OF LIVERPOOL, has invented a lever watch that only requires winding once every eight days.

TIDE POWER.—The French have planned work at Havre for utilizing the ebb and flow of the tide to work turbine wheels to generate power for the dynamo to supply Paris with light.

ENGINEERING NOTES.

AN IRON RAILWAY BRIDGE FOR PERU.—An immense iron bridge 575 feet long is now being constructed over a chasm 250 feet deep, with but two piers, one 122 feet and the other 142 feet high, resting on the banks of the river chasm 100 feet above the bed of the river. This bridge is to take the place of a structure erected in 1872, having its piers in the center of the chasm, and which was washed away by a "cloudburst" which phenomena are common in that neighborhood. The present bridge is being built by the New Jersey Iron & Steel Co. There is something significant, remarks a contemporary, in the fact that American engineers have, during ten years past, secured a good many contracts for constructing iron bridges abroad. It has been because of skill, as the material in many cases, has been purchased in other countries.

THAT GREAT ENGINEERING WORK, the Corinth Canal, which will sever the Peloponnese from the mainland of Greece, and will permit the largest ships to pass directly from the Gulf of Athens to the Gulf of Corinth, is said to be rapidly approaching completion. The canal will have no locks, but is level from end to end and perfectly straight, the width being 96 feet and the depth 36. At the Corinth end it is crossed by a railroad bridge 164 feet high, under which the tallest ships may pass without lowering their topmasts. It is assumed that about 300 vessels from Trieste and Finme, and about the same number from Italian ports, will pass through the canal annually, while it is calculated that between 700 and 800 Greek ships will use the canal—a total, say, of more than 1200 vessels annually, averaging 1500 tons each.

THE MAIL SUBSIDY.—It is estimated by some of New York's large shipping houses that the new law for subsidizing U. S. mail steamers will result in the early construction of some 30 first-class American ocean steamships. English steamship owners, however, expect to make light of the matter, and think the law will be powerless to interfere much with the present system of carrying American mails in English ships. Time will show which is correct.

THE LONGEST BRIDGE in the world is the Lion bridge in Sangang, in China. It extends 5½ miles over an area of the Yellow Sea and is supported by 300 huge stone arches. The roadway is 70 feet above the water and is enclosed in an iron network. A marble lion 21 feet long rests on the crown of every pillar. The bridge was built at the command of the Emperor Kien Long, who abdicated in 1796 on account of old age.

THE HUDSON RIVER TUNNEL.—The great tunnel under the Hudson river between New York city and Jersey City is rapidly nearing completion. The company has notified the various trunk lines terminating in Jersey City that it will be in a position to furnish transportation through the tunnel shortly. The company declares that it will have the first single track in running order in three months.

A NOVEL CONSTRUCTION.—A "locomotive steamboat" is being built at Kristanstad, Sweden, for the navigation of a chain of small lakes, separated by falls. The boat is to be fitted with wheels fitting a track, and power can be applied to either the propeller or the driving-wheels of the locomotive part of the craft. The track is three feet, six inches gauge, with grades of one in 33, and curves of a radius of 100 metres.

THEN AND NOW.—Many years ago an ocean steamship made only 10 or 12 revolutions of the engine, using only five pounds of steam pressure. With this she averaged about eight knots. High-powered ships of the present day use 36 times this pressure and make seven times the revolutions. Their speed is only 2½ times as great.

THE DEMAND FOR SPEED.—Austin Corbin recently said: "If I could buy steamships that would make a trip to Europe inside of four days, they'd be cheap at \$3,000,000 apiece. I'd order them to-morrow. I could literally charge what I pleased for passage and run full all the time. People will pay well to travel fast."

THE FASTEST STEAM CRAFT probably in the world is the steam launch Norwood of New York, which has made a record of 26.28 statute miles. It may be mentioned, however, that a speed of 27.4 knots has been claimed for a European torpedo boat. Such speed, if made, was probably on a spirit of a few minutes.

A NOVEL DEVICE.—An English inventor has constructed a novel device to do away with the enormous pressure of water against the bows of ocean steamers. It consists of one or more screws on each side of the bow, which throws the water aside and creates a dry well in front of the vessel.

THE LARGEST SHIP CANAL in Europe is the great North Holland Canal, from Amsterdam to Helder, five miles; completed in 1825; 125 feet wide at water surface; 31 feet wide at bottom; depth 20 feet.

USEFUL INFORMATION.

TO MAKE GOOD COFFEE.—"It is quite astonishing that so few persons really know how to make a good cup of coffee," said the master of the house, making a wry face over the thick, muggy fluid which the new cook had served for breakfast. "And it is so simple," he continued, "any one could make it. When I was a bachelor and lived in rooms, I always made my own coffee and I never failed. Here is my formula, if you like to have it for your new cook, who, I must say, needs a hint or two. It is better, of course, to grind your own coffee, as then you are sure of having it good, but I never cared to take the trouble or the time myself. Put the ground coffee in the coffee pot, the quantity being regulated according to the number of persons; a family of six would require about a teaspoonful. Add half a pint of cold water and one raw egg, but do not put in the shells, as many ignorant cooks do, considering that the broken bits have a peculiarly clarifying power. Stir all well together, add one quart boiling water, and let the whole boil for 15 minutes. While still boiling, pour in half a cup of cold water, and put the coffee pot on the side of the stove where it will not boil, and let it stand for several minutes. Coffee made in this manner will be found clear, strong and free from 'gronds.'—*New York Tribune.*

LAUNDRY WORK.—One of the most troublesome things, especially for the woman who hoards, is to find a laundress who will do her work properly. Fine undergarments do not require to be rubbed heavily. They are best rubbed through the hands, rather than on the board. It is exceedingly difficult to get the ordinary laundress to understand how to wash such garments. The unskilled hands may tear holes in the sheer lawn and ruin the garment in the first washing. Above all things the laundress should be cautioned against the use of starch in all garments except in a petticoat. Some laundresses have a fatal fancy for the use of starch in all kinds of underwear. Never allow a laundress to wring garments by hand. The wringer does the work with less wear and tear than any hand-wringing. Where silk underwear is worn, it should be washed quickly and rapidly, with some kind of white soap, in warm water, thoroughly rinsed, wrung as dry as possible, and pressed out before it is thoroughly dry. Flannels should be washed in exactly the same way, except that care should be taken to keep the water at the same temperature as the room.—*Good Housekeeping.*

VALUE IN COAL TAR.—It would appear, says the *London Mining Journal*, that the valuable materials obtained from coal tar are almost inexhaustible, for new discoveries of value for various purposes from the slightly product of distilled coal are being constantly brought to light; but the latest addition to the many products obtained from the tar is an article having all the properties of India rubber. It is stated that, after the tar has been refined by means of sulphuric acid, a German chemist has discovered a method by which the residuum can be worked up by simple manipulation into a black mass bearing in appearance a very close resemblance to ordinary asphalt, but at the same time having all the elastic properties of India rubber. By being submitted to continuous and intense heat, it is stated that the material can be decreased in bulk some 50 or 60 per cent, when it becomes very hard indeed, but at the same time very elastic. In the original or soft state the material is termed "mineral rubber asphalt," but when it is dissolved in naphtha it becomes a fine waterproof varnish, suitable for similar purposes to which ordinary varnish is made to form a durable and reliable waterproof for most textile substances especially.

IN BUYING ROPE AND TWINE, great care has to be taken as to the purity of the material. They mix up, for instance, manilla with a cheaper material called "New Zealand." The same is done in the manufacture of twine, where, instead of the pure hemp and flax, they mix in jute and similar stuffs, and can, of course, give such products cheaper; therefore, be careful what you are getting for your money.

LIBRARIES.—The United States leads the world in the number and extent of its libraries. The public libraries of all Europe put together contain about 21,000,000 volumes; those of this country about 50,000,000.

A NEW MATERIAL FOR BELTS.—A peculiar glossy and semi-transparent cloth is said to be made from the fiber of nettle, which is used, among other things, for machine belting. It is claimed to have double the strength of leather.

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SAN FRANCISCO:

Saturday, September 5, 1891.

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Passing Events.

Neither the Nevada nor the Utah mining excitement at Pine Nut or La Plata seems to be as well sustained as first reports would lead one to believe. Still there has been no time for any development of much extent, and some very good mines may be found and opened.

Some little attention is being turned to the operations of the "rain-makers" just now, and the apparent success of Melbourne leads many to doubt the assertion of scientists that the idea is impracticable. The subject is discussed at length in another column.

The change in management at the Temescal tin mines is somewhat of a surprise to the public, but as the new manager is an expert tin miner from Cornwall, and is turning his attention exclusively to the mine itself, the actual value of the mining property will soon be proven.

The Allison Ranch mine at Grass Valley does not seem to have been hoaxed after all, but it is likely that the negotiations pending will result in the mine being again worked in the near future.

Temescal Tin Mines.

The affairs of the San Jacinto Estate (Limited) do not appear to be running harmoniously for some reason. The Temescal tin mines are being worked after a fashion, but the fashion does not seem to suit the English owners of the property, for Manager Robinson has been deposed, or has suddenly resigned, and a Cornish tin miner named J. Harris is in charge.

Col. Robinson was called to London to report, and the day after his arrival, Mr. Harris, who was at the mines, was notified that Col. Robinson was no longer connected with the company's affairs. Mr. Harris stopped all work in connection with the dam and proposed water supply, the farming operations, and everything else except the mine itself. In the *New Era*, there recently appeared an article, presumably by J. H. Crossman, in which he described the various improvements inaugurated by Col. Robinson. Among these was a dam to restrain the waters of the Temescal river, to be used for reclamation and irrigation purposes.

A considerable area of agricultural land was cleared and cultivated, fruit trees and shrubbery planted, the estate surveyed and platted, and a plan formulated for "farm letting" of small holdings on the estate. Col. Robinson also leased the Gavilan series of gold mines on a royalty of 20 per cent of gross proceeds. Meantime he also worked the tin mines, opening them systematically and producing some tin—not by any means as much as is generally supposed, but enough to make a showing of metal, and enough to place a small quantity on the market, one shipment being sent East.

The Colonel was then ordered to England, and Messrs. H. Stephens, purser, and J. Harris, superintendent, were sent out as temporary managers during his absence. The *Era* correspondent says these gentlemen "have made radical changes in the management of the estate during their short stay, and are pursuing a narrow gauge policy that cannot but be detrimental to the true interests of the company. They have entirely ignored the Colonel's (the former manager) plans for the development of this vast property. They are building a large mill at the mine without any possibility of getting water to run it, stopped work on the dam and lower mill, and as far as possible moved or sold the machinery—in fact, suspended all work that is not directly connected with the Cajaleco tin mine, while there are 28 others that are believed to be equally as good."

It seems the London directors were dissatisfied with the conduct of affairs, and sent their own man out to take charge. When this has been done by English companies owning gold and silver mines, it has usually been disastrous to them; but in the case of tin, where the Cornish have experience and we have none, they ought to be able to make a success, if any one can. The experimental mill is still running, and more extensive machinery will soon be at work.

It is to be regretted that there should be any friction in the management of this, the only tin mine actively at work in the United States. There are said to be plenty of orders for the tin, which the company cannot as yet supply. Whether the mine will really do all that has been promised for it remains to be seen. With an experienced Cornish tin-miner in charge, the English owners will doubtless be better satisfied that their property is being worked in the way they are accustomed to. But the San Bernardino county people do not like the idea of seeing the extensive plans proposed so suddenly abandoned.

As to the Gavilan gold mines, the manager, Mr. W. C. Westbrook, has gone to Chicago to arrange for machinery, etc. Why he did not arrange for it in San Francisco is not explained. We know something about gold mining machinery here, as Mr. Crossman might have told him.

THREE gold bricks from Cedros Island mine were received at a San Diego bank a few days ago. They weigh 2173 ounces and are valued at \$35,000. This is said to have been a ten days' cleanup at the National City Reduction Works.

THERE is talk of a scheme to build an electric railway to the summit of Mt. Wilson from Pasadena, the dynamos to be run by water-power.

Asbestos.

In the census year, 1889, the only asbestos mined in the United States came from California, amounting to 30 tons, valued at \$1800. In the same year there was imported into this country asbestos to the value of \$263,393. The production of asbestos in the United States has shown an annual decrease since 1882. The product for 1882 was 1200 short tons; in 1883, 1000 short tons; 1884, 1000 short tons. The product for 1885 showed a decided drop, being only 300 short tons, and this was again reduced to 200 short tons in 1886 and 150 short tons in 1887. In 1888 the product was 100 short tons, valued at \$1800.

Asbestos is found in the United States in a comparatively narrow belt of metamorphic rocks extending along the Piedmont region, or Eastern slope of the Appalachian mountains, from New York through Pennsylvania, Maryland, Virginia, North and South Carolina into Georgia. It is inferior in quality to the best mined in Italy and Canada. Its fibers are comparatively short and somewhat spindle-shaped, with occasional crust-fractures, which not only render it brittle but diminish its tensile strength. Asbestos is also found in considerable quantities in Wyoming and California, but the fiber is not strong. Lately it has been found in quantity in Oregon; but so far the entire product of the United States is from California, according to the late census bulletin.

The fibrous material known to the trade under the name of asbestos comprises at least two distinct species of minerals, one of which, a variety of hornblende, is properly called asbestos; the other is chrysotile, a variety of serpentine, and may be readily distinguished from asbestos by yielding water when heated in a closed tube. Both asbestos and chrysotile are found in regions of altered crystalline rocks, and yet each has its own particular assemblages. The former occurs with metamorphic rocks rich in hornblende, while the latter is found in distinct veins penetrating masses of serpentine, which have resulted generally from the alteration of eruptive rocks, rich in olivine. It is customary, however, in trade circles to include both varieties under the name of asbestos.

Asbestos is used in the manufacture of fire-proof paints, roofing, piston packing, felt packing, fire-proof cements, sheet and roll mill boards, flooring, and for the covering of steam pipes and boilers. It is largely used in lining for fire-proof safes, and is also made into yarn, cloth and paper. Non-consuming lampwicks and fire-proof drop curtains for theaters are now being made of this material. Some demand has also been created for its use in the manufacture of insulators for electric wires.

The fiber of the California and American asbestos generally, is more brittle and harsh than the imported, and is not so well adapted to the manufacture of spun and woven goods. It will stand, however, a greater degree of heat than the Canadian or foreign material, and is more suitable for the manufacture of fire-proof cement and paint, for which length of fiber is not essential. If the conditions were such that the mineral could be economically mined in this country, it is probable a considerable amount of capital would be invested in the industry. An examination of the specimens at the State Mining Bureau in this city shows that the mineral is found in many of the counties of this State, though it is actually mined at but few localities. It is found also in several places in Nevada and Arizona. The market here seems to be limited, and only the best quality is salable. The imports of crude asbestos are steadily increasing, the amount for 1889 being greatly in excess of any previous years, being about 51 per cent over imports for 1888, 81 per cent over 1887, and 89 per cent over 1886, exceeding the entire imports from 1869 to 1885 inclusive. This shows a steadily increasing demand by which owners of asbestos mines here should be benefited. Yet the American production shows a steady decrease, notwithstanding the increase of demand.

AN ENTOMOLOGIST'S CATCH.—G. W. Dunn, a well-known naturalist, has returned to this city with over 82,000 entomological specimens from Lower California and Sonora. Of these, over 70,000 are coleoptera, 5000 orthoptera, comprising grasshoppers and crickets, and 4000 hnterflies. Over 100 of these insects are new,

Two Mining Booms.

The news from the Utah and Nevada mining "booms" does not appear to be very encouraging after all. The Zinn mine, at Pine Nut, has been talked about as one of wonderful richness. Governor Colcord of Nevada, who has himself prospected in that region, says the reports are from men who have more enthusiasm than knowledge of mining. He did not want to see a lot of men rush to the district and be disappointed. Governor Colcord gave his reasons in detail for not believing that there was anything very promising at Pine Nut. As a man who had been a practical miner and prospector the best part of his life, and who had worked in and been connected with mines almost to the day he took office, he said he felt confident that he understood the business very well. The trouble with Pine Nut was that practically nobody vouched for it but Zinn, an ignorant miner. Zinn had a partner, a half-owner in the mine, one Schultz, who had not yet said that he believed there was a big mine in sight. Until Schultz said something, every good mining man who knew him would be doubtful about the real value of the strike. The Governor declared that Schultz, a butcher in Carson, was an honest man, and that if anybody could get him to say that the rumors about Pine Nut were true, it would be time enough to believe them. Schultz has been giving Zinn a "grub stake" for years, and now that the latter had a strike, Schultz would not, or at least had not said whether this was a good one or not. This, in the opinion of the speaker, was a suspicious circumstance and might well be taken into consideration by men contemplating a trip to Pine Nut.

The one fact, though, that, in the belief of Nevada's Governor ought to deter men from rushing to Pine Nut, is that all the claims for a distance around have already been taken up, and there is nothing left for anybody who has not plenty of money.

As to the La Plata mines, near Ogden, Utah, some details are given in our "Mining Summary," on another page. The man who writes the facts is a miner, and while he believes the district will be a good one, he does not think it of great extent or wonderful richness. A Montana paper has also interviewed Gregory N. Lyons, who has just returned from La Plata. He is not at all impressed. He says: "Arriving in camp, we looked in vain for the two-story hotel that had been pictured in such glowing terms by the Ogden papers. A tent was the only excuse we could find. The same was true of the reduction works, and all other great industries told about with all the flower of rhetoric and all the skill of a professional liar. In short, two insignificant prospect holes represented all the mines in the district, and a number of claims, with a few scattered tents and a lot of disgruntled prospectors, made up the boom. To be sure, they had found some rock there that would run way up in lead, but it was only at the bottom of a six-foot shaft, and no one could tell what the outcome would be. There was no more excuse for a boom than there would be for me to go out on the hill here and try to get up an excitement over any old deserted prospect hole, not so much, since every one who goes in there must pay out a lot of money and lose his time for nothing."

MINE SURVEY.—Mr. Bagget, attorney for the West Consolidated Virginia and California Mining Co., filed in the District Court at Virginia, Saturday, an application for a survey of the underground workings of the Consolidated California and Virginia to ascertain if the latter company is or has extracted ore from the West Consolidated Virginia and California's ground. Both locations are included in the same patent, the West Consolidated Virginia and California Co. deriving title by a deed from the Consolidated California and Virginia Co. The contest will definitely settle the question whether all the ledges in Storey county are included in the main Comstock lode.

A MINERAL EXHIBIT.—The State Mineralogist has been requested by the trustees of the State Mining Bureau to collect and collect as complete a collection as possible of the ores and minerals of California for an exhibit at the World's Fair. All miners of the State and others interested in the development of the mineral resources of the State have also been requested to contribute to the collection.

The McIntosh & Seymour Engines.

(Continued from page 145.)

will be seen from the cut, is a horizontal tandem compound engine, with high pressure cylinder and receiver steam jackets. This is considered the most economical type, with as high pressures as can be ordinarily carried. The chief peculiarity of this engine is the position of the high pressure valve together with its actuating gear upon one side of the engine and that of the low pressure upon the opposite side. This allows each valve to be driven in the most direct and simple manner, separately and makes easily accessible the moving parts, and is the only arrangement

brisk circulation through all the jackets, which is so essential to their efficiency. The water condensed is returned to the boiler.

The low-pressure valve is moved by a fixed eccentric and the high-pressure valve by the governor or automatic cut-off regulator. This and also the valves, frame, solid steel shaft and moving parts generally, are precisely similar to those of the Standard high-pressure engine. The simple, perfectly balanced piston valves are prevented from leaking by adjustable seats, the efficiency of which has been fully proven in actual service. The governor commands itself for its simplicity, durability and power. Without any tendency to over-sensitiveness, it will regulate the speed of the engine within

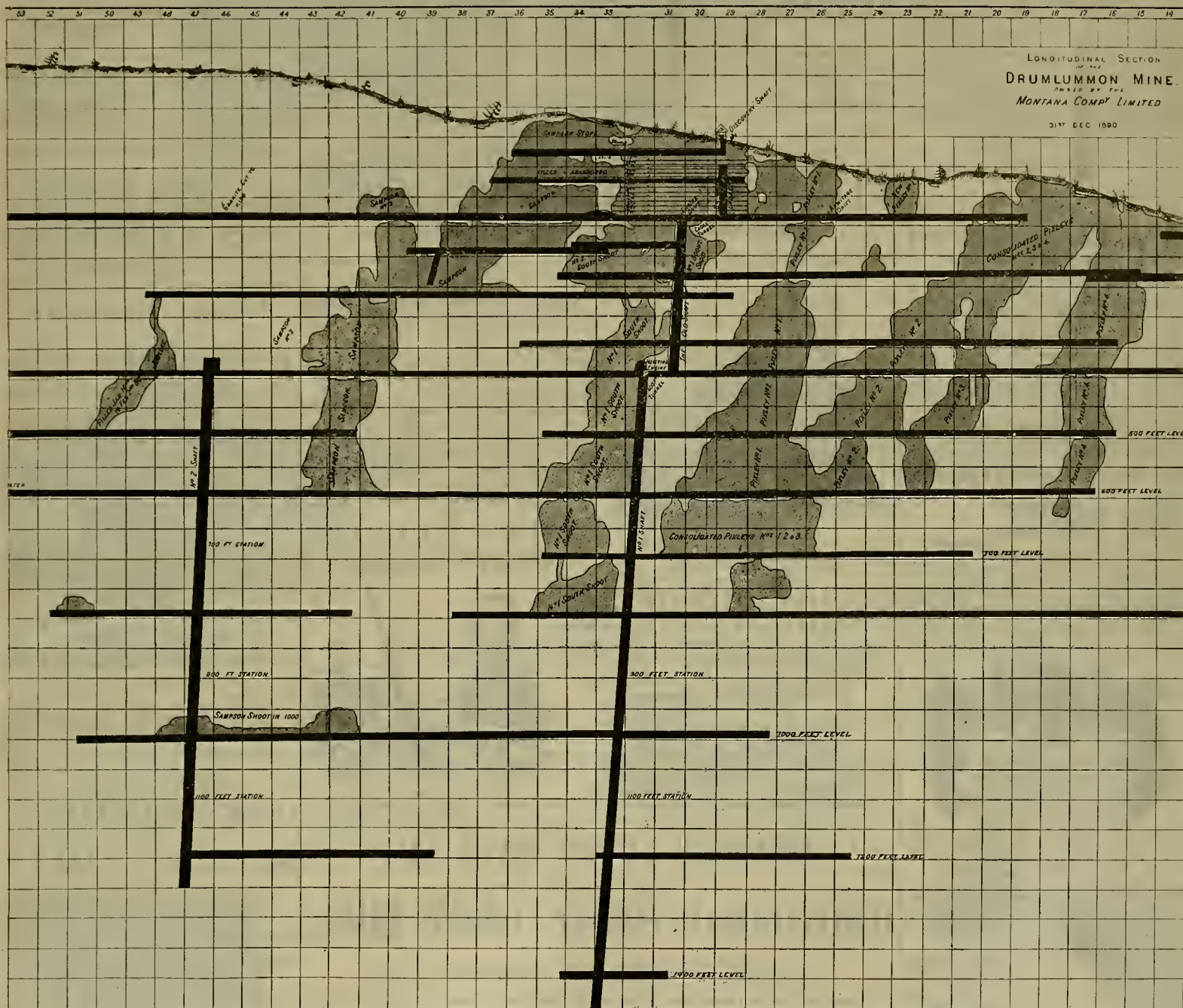
The Drumlummon Mine.

The Drumhomon mine, Lewis and Clarke county, Montana, is owned by the Mootana Co., Limited, an English organization. The mine is a wonderful producer, and has paid big dividends. It has three mills aggregating 120 stamps. The ore is not of a very high grade, but there is plenty of it. The longitudinal section of the mine signed in the accompanying cut shows the developments up to the end of the year. It will be seen that an immense amount of development work has been done. The reserves of both high and low grade ore are quite extensive. Very systematic work is carried on in this mine, gangs of men being

Tajo mine, which will soon be shipped. This type is getting to be a favorite for mining and electric lighting purposes, by reason of the small space they take up.

In marine work, two twin engines are being made for a coasting schooner. These are compound, 12 and 24 by 20 inches. Quite an extensive repair job has just been completed on the Salvadorian Government vessel Coscatlan. The machinery was overhauled; new decks put in, and the vessel generally remodeled. The work has all been done, and the vessel is ready for sea.

The works have started in on the new quarantine boat, and have the contract for the boat complete with machinery. She is to be of



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possible with a tandem engine which avoids a very complicated and unsatisfactory valve driving gear. Hence this arrangement, which is patented, is a very valuable feature in a high-speed compound engine for electric-lighting purposes.

Since the low-pressure cylinder exhausts into a vacuum, it is impossible to "onshion" satisfactorily, on this side of any form of double compound engine. This prevents smooth running and renders necessary frequent adjustment and attention. Since both pistons are on the same rod, this difficulty is avoided in the tandem engine, and the compression obtained in the high-pressure cylinder gives remarkable smoothness and quietness to the running of the engine.

Live steam, after passing through the jackets of the high-pressure cylinder, is used to jacket the receiver. The lower temperature of the steam in the latter causes considerable condensation in its jacket, and this induces the

one per cent for all changes of load and pressure from zero to full load.

Like the high-pressure engine, the compound is of the double-crank class, with two overhanging wheels, and when desired is provided with a foundation box extended under the cylinders, as shown on the second and third pages following, making it entirely self-contained. The workmanship and materials used throughout are simply the very best that can be obtained, and each engine is subjected to a most exhaustive test before leaving the shops. The agents of these engines in this city are Rix & Birrell, 38-44 Fremont St.

It is stated that the San Jose Watch Factory at Alviso will be in running order by October 1st. The building is about completed.

GOLD is beginning to flow back to this country from Europe, after having been moving in the opposite direction for some months.

kept prospecting, while others are removing ore. The lode is a very large one. The mine is one of the famous ones of Montana.

Foundry Notes.

At the Fulton Iron Works, they are just completing an 18x42 Corliss engine for the Haywards Electric Light Co., which is to take the place of smaller engines previously in use. New shafting, pulleys, etc., go with the plant. A lot of shafting and pulleys are also being made for the California Electric Light Co. and the Vallejo Electric Light Co.

There is not much going on in the mining machinery line, though some small orders are being filled for Mexico. A 16x36 Myers cut-off engine is being built for a mine in that country, and with the same order go a number of pans and settlers. A 10-stamp mill, for the same region, is also being constructed. They are building a compound, vertical engine for the

composite construction—iron frame and wooden sheathing. The compound engines will be 10 and 20 by 12. The boat is to be about 85 feet long and 16 feet beam.

A Corliss engine, 14x30, has just been completed for the Contra Costa Laundry Co., of Oakland, which is to drive all the machinery of the laundry.

GOVERNMENT MAPS—The Government has five parties of surveyors now at work in California, and Prof. S. H. Thompson of the U. S. Geological Survey says they will remain in the field as long as the weather will let them. A map of the Grass Valley gold region, on a scale of one inch to 1200 feet, is being made especially for the benefit of miners. The parties in the southern part of the State are working particularly for the farmers, locating arable land well belted and making maps which will prove useful to those contemplating the construction of irrigation systems.

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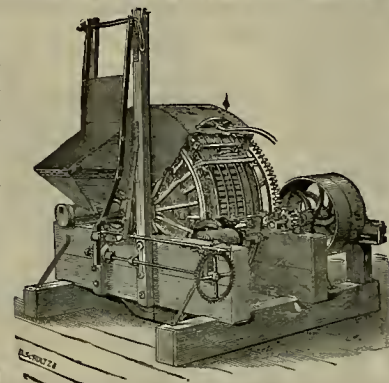
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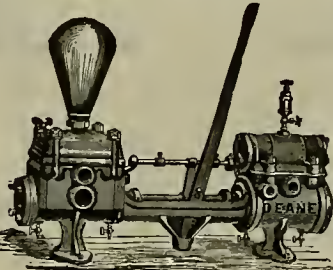
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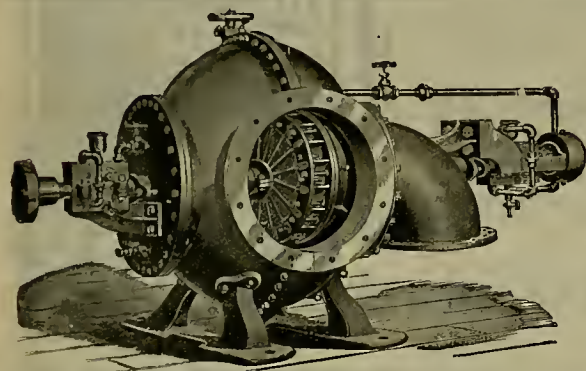
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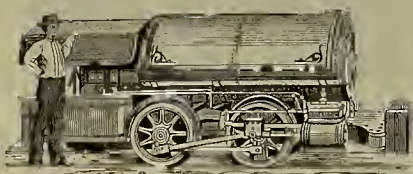
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Belcher M Co., Nevada	42	50c.	July 16, Aug 7, Sept 28.	O L Perkins.	331 Pine St.
Bullion M Co., Nevada	35	50c.	July 16, Aug 7, Sept 28.	R Grayson.	331 Pine St.
Challenger M Co., Nevada	30	50c.	July 16, Aug 7, Sept 28.	C E Elliott.	309 Montgomery St.
Challenge Con M Co., Nevada	9	50c.	July 31, Sept 2, Sept 23.	C L McCoy.	331 Pine St.
Cruikshank M Co., California	2	5c.	July 7, Aug 7, Sept 7.	E J Koch.	211 Sansome St.
Exchequer M Co., Nevada	31	25c.	July 27, Aug 27, Sept 17.	C E Elliott.	339 Montgomery St.
Golden Fleeced Gravel M Co., Cal.	15	45c.	July 16, Aug 12, Sept 19.	W J Gleason.	Phelan Block
Golden Jacket M Co., Nevada	4	50c.	July 2, Aug 13, Sept 12.	R G McEllan.	331 Montgomery St.
Gould & Curry M Co., Nevada	27	30c.	July 22, Aug 25, Sept 17.	A K Durbow.	309 Montgomery St.
Gray Eagle M Co., California	25	5c.	Aug 12, Sept 14, Oct 6.	A W Barrows.	303 California St.
Inyo Marble Co., California	14	10c.	Aug 21, Oct 2, Oct 23.	T S Strafford.	309 Montgomery St.
Julia Cons M Co., California	24	10c.	Aug 16, Sept 16, Oct 16.	A B Cooper.	325 Montgomery St.
Martin White M Co., Nevada	26	25c.	July 21, Aug 21, Sept 21.	C E Elliott.	309 Montgomery St.
Mexican M Co., Nevada	43	25c.	Aug 19, Sept 14, Oct 6.	C E Elliott.	309 Montgomery St.
Monte Christo M Co., Nevada	5	25c.	Aug 17, Sept 23, Oct 14.	L Leavitt.	533 Kearny St.
Nor El D. rado G M Co., California	2	5c.	Aug 4, Sept 10, Oct 2.	J W Pew.	310 Pine St.
North Belle Isle M Co., Nevada	13	25c.	Aug 23, Oct 2, Oct 30.	J W Pew.	310 Pine St.
North Gould & Curry M Co., Nevada	12	10c.	Sept 1, Oct 2, Oct 19.	C H Mason.	531 Montgomery St.
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Savage M Co., Nevada	76	50c.	July 20, Aug 18, Sept 10.	E B Holmes.	309 Montgomery St.
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Silver King M Co., Arizona	7	20c.	Aug 13, Sept 23, Oct 27.	J W Pew.	310 Pine St.
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Terrakoff Con M Co., California	6	1c.	July 11, Aug 11, Sept 11.	W J Burnett.	308 Pine St.
Terrell M Co., Mexico	5	25c.	Aug 13, Sept 14, Sept 30.	A Clement.	309 Montgomery St.
Union M Co., Nevada	4	25c.	Aug 31, Oct 5, Oct 25.	A W Barrows.	303 California St.
Weldon M Co., Arizona	4	5c.	Aug 31, Oct 1, Oct 22.	A Waterman.	309 Montgomery St.
Yellow Jacket M Co., Nevada	49	50c.	Aug 31, Oct 2, Nov 7.	W H Blawett.	Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Cons Golden Gate & Sulphure Co.	G W Llesman.	331 Pine St.	Annual.	Sept 10
Grand Prize M Co., Nevada	R R Grayson.	331 Pine St.	Annual.	Sept 15
Gray Eagle M Co., California	A W Barrows.	303 California St.	Annual.	Sept 14
Inyo Marble Co., California	G W Luce.	132 California St.	Annual.	Sept 10
Martha King M Co.	J F Norman.	419 California St.	Annual.	Sept 14

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Ohampton M Co.	T Wetzel.	320 Sansome St.	10.	Aug 15
Oreale & Virginia M Co., Nevada	A W Havens.	309 Montgomery St.	50.	Aug 17
Potosi M Co.	E M Hall.	314 Montgomery St.	30.	Sept 10
Reche M Co.	A W Barrows.	303 California St.	300.	Sept 10
Mayflower Gravel M Co., California	D M Kent.	Grass Valley.	50.	Aug 20
North Banner Cons M Co., California	T J Mitchell.	Grass Valley.	50.	Aug 20
North Commonwealth M Co., Nevada	J W Pew.	310 Pine St.	25.	June 17
North Star M Co., California	A W Barrows.	303 California St.	50.	Sept 10
Pacific Coast Borax Co., California	A H Clough.	330 Montgomery St.	100.	Sept 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING August 13	WEEK ENDING August 20	WEEK ENDING August 27	WEEK ENDING Sept 3
Alpha	70 1.00	75 .80	70 .75	60 .65
Alta	1.00 .70	56 .65	65 .60	1.20 .60
Andes	1.00 1.15	1.20 1.30	1.15 1.20	1.20 .60
Belcher	1.40 1.60	1.50 1.25	1.30 1.10	1.25 .60
Belle Isle	.60 .55	.55 .35	.40 .40	.60 .60
Best & Belcher	3.10 4.25	3.40 4.05	3.15 3.60	3.35 3.55
Bullion	2.85 4.65	2.75 3.40	2.75 3.00	2.00 .60
Bulwer	.50 .40	.30 .25	.20 .20	.25 .60
Commonwealth	.40 .35	.35 .40	.20 .25	.25 .60
Con. Va. & Oal.	5.62 7.62	6.37 8.12	6.75 6.12	6.75 6.12
Challenge	1.10 1.33	1.10 .90	1.00 .80	1.15 .60
Chollar	1.00 1.20	1.30 1.40	1.10 .85	1.15 .60
Confidence	4.25 .40	.40 .10	.10 .10	.10 .10
Con. Imperial	.10 .15	.10 .10	.10 .10	.10 .10
Oaledonia	.60 .65	.45 .50	.40 .50	.40 .50
Crown Point	1.25 1.85	1.80 2.00	1.65 1.55	1.65 1.70
Crocker	.10 .10	.10 .10	.10 .10	.10 .10
Del Monte	.10 .10	.10 .10	.10 .10	.10 .10
Eureka Con.	3.00 .30	.30 .10	.10 .10	.10 .10
Exchequer	.65 .90	.50 .65	.40 .70	.60 .70
Grand Prize	1.15 .15	.15 .10	.10 .10	.10 .10
Gould & Curry	1.45 1.90	1.55 1.75	1.45 1.75	1.60 1.70
Hale & Norcross	1.50 2.15	1.80 2.05	1.60 1.90	1.90 1.90
Julia	.25 .20	.15 .15	.10 .10	.10 .10
Justice	.40 .45	.65 .70	.55 .55	.55 .55
Nor. & Oal.	.30 .40	.30 .25	.25 .30	.30 .30
Lady Wash	.20 .15	.15 .10	.10 .10	.10 .10
Mono.	.45 .45	.30 .45	.30 .25	.25 .25
Mexican	2.30 2.90	2.35 2.60	2.10 2.55	2.10 2.25
Nor. & Oal.	.50 .55	.35 .40	.25 .25	.20 .40
North Belle Isle	.20 .20	.20 .20	.20 .20	.20 .20
Nev. Queen	.50 .50	.50 .50	.50 .50	.50 .50
Occidental	1.00 1.25	1.00 1.15	1.00 .90	1.00 1.00
Opfir	5.80 4.25	3.60 4.30	3.50 3.55	3.75 3.75
Potosi	1.85 1.15	.65 1.30	.65 1.10	1.10 1.20
Overman	4.00 6.75	2.25 4.50	3.35 3.10	3.35 3.75
Peerless	.10 .15	.15 .10	.10 .10	.10 .10
Peer	.10 .15	.15 .10	.10 .10	.10 .10
Savage	1.70 2.05	1.70 2.65	2.55 2.55	2.55 2.55
S. & M.	.85 1.00	.75 .75	.80 .85	.75 .75
Sierra Nevada	2.70 3.45	3.00 3.30	3.60 3.00	3.15 3.15
Silver Hill	.20 .26	.15 .15	.16 .16	.16 .16
Scorpion	.35 .45	.35 .35	.35 .35	.35 .35
Union Con.	2.35 2.95	2.40 2.35	2.55 2.15	2.35 2.35
Utah	.75 .90	.80 .85	.75 .70	.75 .75
Yellow Jacket	1.55 1.90	1.60 1.85	1.70 1.35	1.70 1.70

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb.	@ 13 1/2	English, lb.	16 @ 20
BORAX.		Santon tool.	9 @ 20
Refined, in car lots	@ 8	Sp. Diam tool	9 @ 9
Powdered, do	@ 8	Pick & Hammer	4 @ 10
Concentrated, do	@ 7 1/2	Machinery	4 @ 5
All grades jobbing at advance		Tool Calk	4 @ 5
COPPER.		TINPLATE.	
Belt	22 @	B. V. steel grade	00 @
Sheathing	22 @	14x20, spec.	00 @
Ingot, jobbing	@ 15	Charcoal, 14x20	7 00 @
Do, wholesale	@ 14 1/2	Do roofing, 14x20	6 60 @
Fire Box Sheets	22 @ 24	Do, do, 20x25	13 00 @
IRON.		COAL.	
Bar, base	3 @ 3 1/2	Pig, in spec, 100 lb	@ 2 1/2
Norway, base	4 1/2 @ 5 1/2	Irreg. bar, 100 lb	@ 2 1/2
Pig IRON.		SPOT FROM YARD—PER TON.	
England 30 ton	25 00	Wellington	\$9 00
Glenbrook	27 00	Crete	8 00
Am. Soft, No. 1	28 50	Carbion Hill	8 00
Oregon Pig	26 50	Nanaimo	9 00
Puget Sound	27 00	Gilman	7 00
Clay Lane White	23 00	Castle	7 00
Shots No. 1	37 00	Good Bay	6 00
Langdon	25 00	Channel	9 50
Thorndiffe	26 00	20 03 Egg, hard	14 00
Gatscherrie	25 00	25 00 Cumberland, in sacks	14 00
Barrow	28 00	25 00 Do, bulk	13 00
Carzofelt	23 00	25 00 Wall-end	9 00
CHROME IRON ORE.		SCOTCH SPLIT.	
Per ton	10 00 @	Brynmor	8 00
LEAD.		WEST HARTLEY.	
Pig	4 1/2 @	20 00 PER TON	
Bar	5 1/2 @	Australian	@ 7 00
Sheet	7 1/2 @	Liverpool Steam	@ 7 00
Pipe	6 1/2 @	Scotch Split	@ 7 00
SILVER.		CUMBERLAND.	
(Discount 10% on 500 bags)		Lehigh Lump	@ 14 00
Drop, 1/2 bag	1 90 @	Cumberland	10 00 @
Buck, 1/2 bag	2 10 @	Egg, hard	12 00 @
Chilled, do	2 30 @	West Hartley	@ 7 60
QUICKSILVER.		ENGLISH, to load.	
By the flask	40 50 @	Do, spot, in bulk	@ 12 00
Flasks, old	40 @	Do, spot, in bulk	@ 12 00

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Assessment Notices.

NEW EL DORADO OLD MINING COMPANY.
Location of principal place of business, San Francisco, California. Location of works, El Dorado County, California.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of August, 1891, an assessment, No. 2, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 14th day of September, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 23d day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of August, 1891, an assessment of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 14th day of September, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 6th day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

INYO MARBLE COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Inyo County, California.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of August, 1891, an assessment (No. 14) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 137 Montgomery Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 5th day of October, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 23d day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
G. W. LUCE, Secretary.
Office, 137 Montgomery Street, San Francisco, California.

26TH INDUSTRIAL EXPOSITION
—OF THE—
Mechanics' Institute, 1891,
Opens August 18th; Closes September 26th.
New Features! Special Attractions!

Music by the First Infantry Regiment Band of Fifty Performers, including JESSIE MILLAR, the Wonderful Young California Cornetist, and the SLIDE TROMBONE QUARTET.
In the Art Gallery will be Paintings in oil and water-color by our well-known local artists, and the great LASSIERE COLLECTION of 200 paintings by the most noted European artists, valued at \$200,000, photography, crayon and pastel work. Also natural products, manufactures and inventions, a grand display of illuminated photographic views three times each evening, 4000 specimens of natural history, magnificent display of tropical plants and flowers, and many other novelties.
A Trifleson.—Double Season Ticket, \$6; Single Season Ticket, \$3; Children's Season Ticket, \$1.50; Adults, Single Admission, 60c; Children, 25c.
DAVID KERR, Pres. J. H. CULVER, Sec.

FRANCIS SMITH & CO.,
Manufacturers of
Sheet Iron and Steel
PIPE!
ALL SIZES.
130 Beale Street, San Francisco, Cal.

Iron cut, punched and formed, for making pipe on ground. All kinds of Tools supplied for making Pipe. Estimate given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

EVERY ONE in need of information on the subject of advertising will do well to obtain a copy of "Book for Advertisers," 368 pages, price one dollar. Mailed, postage paid, on receipt of price. Contains a careful compilation from the American Newspaper Directory of all the best papers and class journals; gives the circulation rating of every one, and a good deal of information about rates and other matters pertaining to the business of advertising. Address ROWELL'S ADVERTISING BUREAU, 10 Spruce St., N.Y.

ANNUAL MEETING.—THE REGULAR Annual Meeting of the Inyo Marble Company will be held at the office of the Company, No. 137 Montgomery Street, San Francisco, California, on THURSDAY, the Tenth day of September, 1891, at the hour of one o'clock p. m., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books close on Monday, September 7th, at 2 o'clock p. m.
G. W. LUCE, Secretary.
Office, G. W. Luce, Secretary, No. 132 California Street, San Francisco, California.

SITUATION WANTED By a man 42 years old, with 7 years experience in gold, silver and opal mining and surveying; graduate of the Mining Academy in Schenitz, Hungary. References in Hungarian (Magyar) language. Content with moderate salary until he proves his ability. Address FREELAND, PA., Lock Box 52. O. S.

ESTABLISHED 1866.
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HENRY G. HANKS,
Practical and Industrial Chemist, Assayer and Geologist.
718 MONTGOMERY ST., - SAN FRANCISCO.
Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.

Educational.

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Assay Office and Chemical Laboratory,
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Montgomery Street, San Francisco. For nearly 15 years with Thomas Price, as Chief of the Ore-Assay and Analytical Department. Lessons given in Assaying and Chemistry.

Van Ness Young Ladies' Seminary,
1222 Pine St., San Francisco.

A FIRST-CLASS PRIVATE SCHOOL UNDER THE ownership and direction of DR. S. H. WILLEY, aided by a corps of 12 experienced teachers. Numbers limited; home care; instruction the choicest; music a specialty. Only a few vacancies; apply soon. Term begins August 3d. Send for circulars.

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Surveying, Architecture, Drawing and Assaying,
723 MARKET ST., SAN FRANCISCO, CAL.
Open All Year.
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Assaying of Ores, \$25; Bullion and Chlorination Assay, \$25; Blowpipe Assay, \$10. Full course of assaying, \$60. ESTABLISHED 1864. Send for circular.

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A State School of Mining Engineering, located in the heart of the Lake Superior mining region, giving practical instruction in Drawing, Blue-printing, Mechanics, Mechanism, Properties of Materials, Graphical Statics, Mechanical and Electrical Engineering, Surveying, Ore-dressing, Metallurgy, Plane, Railroad, and Mine Surveying, Hydraulics, Mining, Mineralogy, Petrography, General, Economic, and Field Geology, etc. Has Summer Schools in Surveying, Spot-practice, and Field Geology. Laboratories, Shops and Stamp Mill well equipped. Tuition free. For Catalogues apply to the Director, Houghton, Mich.

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Ladies admitted into all Departments.
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FOR SEVENTY-FIVE DOLLARS THIS College instructs in Shorthand, Type Writing, Book-keeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business for six full months. We have sixteen teachers, and give individual instruction to all our pupils. Our school has the graduates in every part of the State.
SEND FOR CIRCULAR.
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C. S. HALEY, Secretary.

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(Successors to THOMSON & EVANS,
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MACHINE WORKS,
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and all kinds of MACHINERY.
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Hours: From 11 until 8. Rooms 11 and 12, 1432 Geary St., La Grange. Hours from 3 until 5. All Diseases of the Eye successfully treated by his new system without the use of the knife.
If you wish to advertise anything anywhere at any time write to GEO. P. ROWELL & CO., No. 10 Spruce St., New York.

HERCULES GAS OR GASOLINE ENGINE

FOR POWER OR PUMPING PURPOSES.

The Lowest Priced Reliable Gas Engine on the Market.

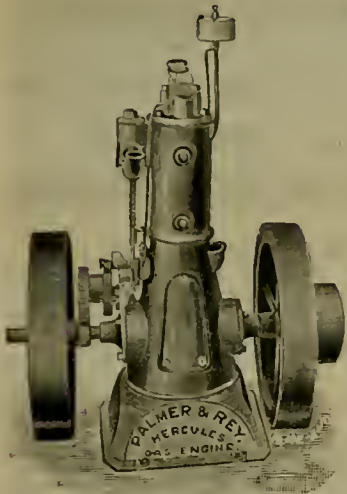
SEND FOR ILLUSTRATED CATALOGUE AND PRICE LIST.

For Simplicity It Beats the World. It has Fewer Parts, and is therefore Less Likely to get Out of Order than any other Gas Engine now built.

IT OILS ITSELF FROM A RESERVOIR. JUST LIGHT THE BURNER, TURN THE WHEEL, AND IT RUNS ALL DAY.

No Carburetor to get out of order. No Batteries or Electric Spark to care for. Always Ready, and a Boy can start it at once. No Double or False Explosions, which are frequent with the Unreliable Spark.

IT RUNS WITH A CHEAPER GRADE OF GASOLINE THAN ANY OTHER ENGINE, AND CONSEQUENTLY IT COSTS LESS TO RUN IT.



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ELECTRIC BLASTING.

VICTOR ELECTRIC PLATINUM FUSES.
Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in neat paper boxes of 50 each. All tested and warranted. Single and double strength, with any length of wires.

VICTOR BLASTING MACHINE.—Made in two sizes. No. 2 fires 20 to 30 holes. No. 1 fires 5 to 8 holes. Adapted for prospecting, stump blasting, quarry and general railroad work.

"PULL UP" BLASTING MACHINE.—The strongest and most powerful machine ever made for Electric Blasting. No. 4 size fires 70 holes. No. 3 size fires 40 holes. Are especially adapted for submarine blasting and large mining work.

Standard Electric Fuse and Blast Tester, Wire Reels, new design, Leading and Connecting Wire.

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JAMES MACBETH & COMPANY,
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PARKE & LACY CO., San Francisco, Cal., AGENTS.

Send for Catalogue

WILLIS O. DODD, Vice-President and Manager.

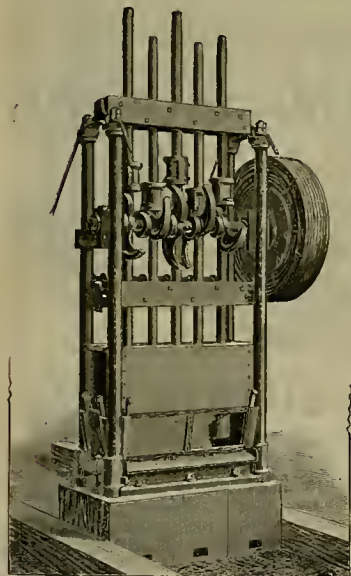
IRA P. RANKIN, President.

PACIFIC IRON WORKS,

ESTABLISHED 1850.

127 FIRST STREET, SAN FRANCISCO.

MINING MACHINERY, ENGINES AND BOILERS.



MACHINERY FOR REDUCTION OF GOLD,
SILVER, LEAD AND COPPER ORES

— BY THE —

Milling, Smelting or Concentration Process,
Of Most Improved Design and Construction

SPECIALTIES:

WHEELLOCK'S AUTOMATIC CUT-OFF
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WATER-JACKET SMELTING FURNACES
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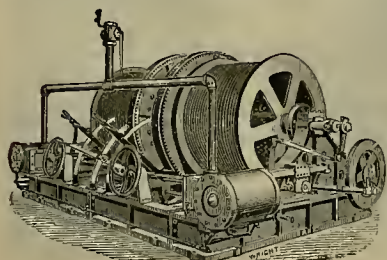
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BAKER'S HORSE-POWER HOISTS.

WATER WHEELS.

SEND FOR CIRCULARS.

HOISTING ENGINES FOR MINES



1, 2, or 4 Drums, with Reversible Link
Motion or Pat. Improved Friction.

MADE ONLY BY THE

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1 to 7 N. First St., Portland, Oregon.

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PLACER AMALGAMATORS

Combined with Steam Shovel or Dredge.

BUCYRUS SYSTEM.

NEW METHOD OF PLACER MINING.

Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.

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Dynamite and Blasting Powder,

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And Experimental Machinery of All Kinds.

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DRAWINGS, PLANS and SPECIFICATIONS made for
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Jobbing of every description promptly attended to.
FINE WORKMANSHIP GUARANTEED.

BLOWING ENGINE FOR SALE.

Vertical pattern, with balanced steam slide valve gear, steam cylinder 14 in. diameter, air cylinder 40 in. diameter, stroke 24 in. 1 to 100 strokes per minute; engine new. For price and particulars address **JAMES LEFFEL & CO., Springfield, Ohio.**

JAMES M. HAVEN.

THOMAS E. HAVEN,
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HAVEN & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW,

No. 530 California Street,
SAN FRANCISCO, CAL.
Telephone No. 1746.

PARKE & LACY COMPANY,

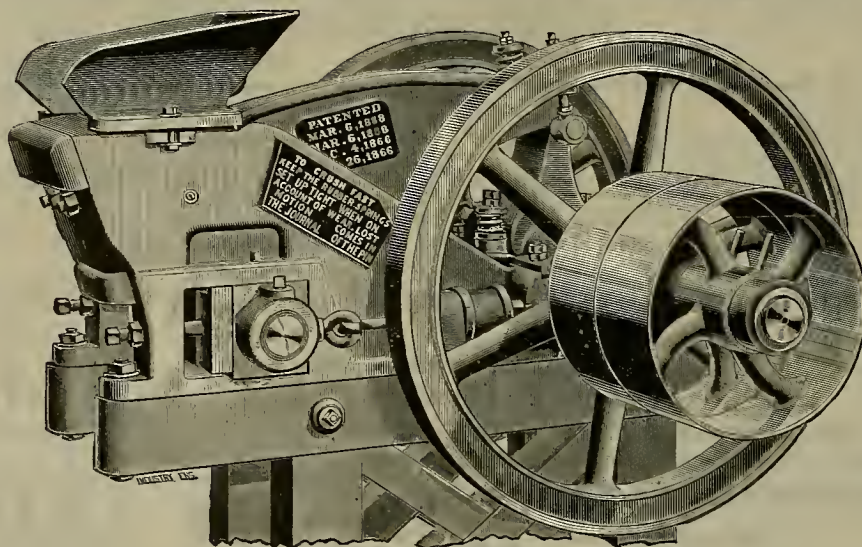
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ENGINES,
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DODGE IMPROVED ROCK BREAKER.

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LONG DISTANCE ELECTRIC POWER TRANSMISSION.

WATER POWER

Made Available over Circuit Many Miles Long for Running TRAMWAYS, HOISTS, DRILLS, STAMPS, PUMPS, LIGHT, &c.

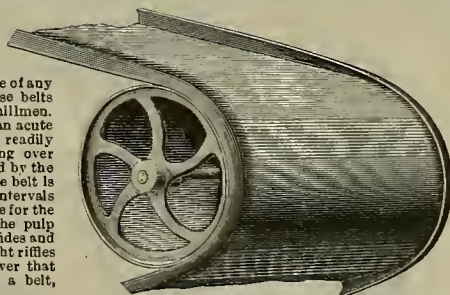
FOR PARTICULARS AND ESTIMATES, CALL ON OR ADDRESS

THOMSON-HOUSTON ELECTRIC CO.,

15 FIRST STREET, SAN FRANCISCO.

THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight rifflings also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

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Stationary and Compound Engines, Flour, Sugar, Saw and Quartz Mill Machinery.

AMALGAMATING MACHINES. CASTINGS AND FORGINGS Of Every Description

ALL WORK TESTED AND GUARANTEED.

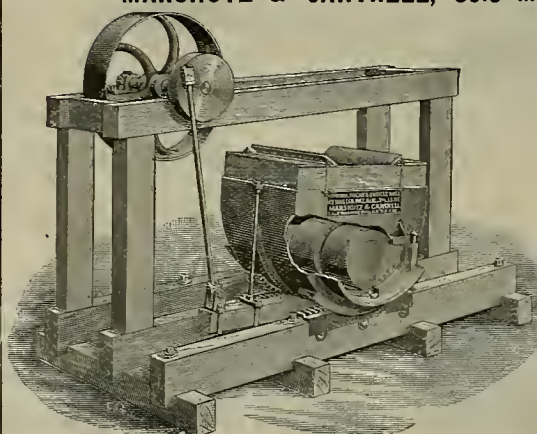
IMPROVED PORTABLE HOISTING ENGINES.

NATIONAL ROCKER QUARTZ MILL.

KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY, 12 Tons in 24 Hours. 3 H. P.

MARSHUTZ & CANTRELL, Sole Manufacturers.



The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or any other ore crushing machines now before the public.

Send for Circulars and Price List.

MARSHUTZ & CANTRELL.

FRUE ORE CONCENTRATOR

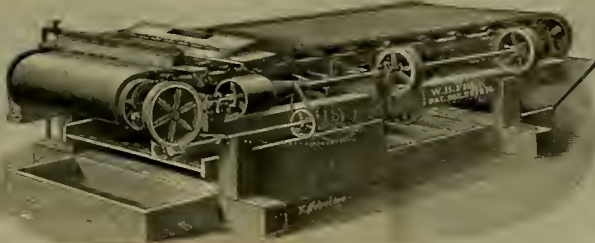
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



PROTECTED BY PATENTS—September 2, 1879, April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

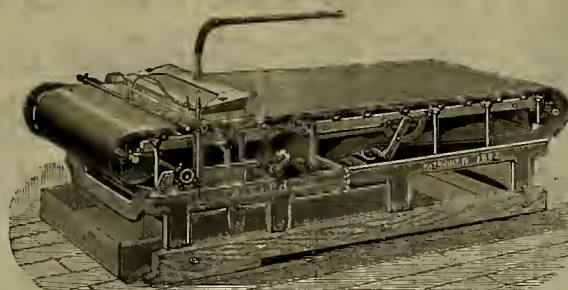
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frue" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.

Price "Triumph" Concentrators, with Plain Belt - - - - - \$550 f. o. b.



(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company, Principal Office, 401 California St., cor. Sansome, S. F. Location of Works, Orass Valley, Nevada Co., Cal. ORASS VALLEY, NEVADA CO., CAL., Nov. 10, 1886.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.: GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

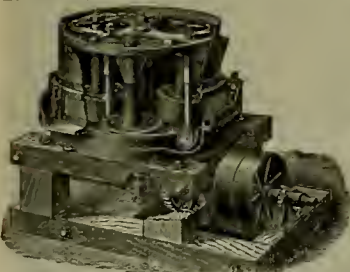
At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

[Signed] Sup't North Star and Original Empire Mining Co. N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

JOSHUA HENDY MACHINE WORKS,

39 to 51 Fremont Street, San Francisco, Cal.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin it used be. Circulars and testimonial letters furnished on application.



F. A. HUNTINGTON.

—MANUFACTURER OF—

CENTRIFUGAL ROLLER QUARTZ MILLS

Concentrators and Ore Crushers,

Mining Machinery of Every Description.

Steam Engines and Shingle Machines.

SEND FOR CIRCULAR.

Centrifugal Roller Quartz Mill.

212 FIRST STREET

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IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best; in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

SAN FRANCISCO NOVELTY, GOLD, SILVER AND NICKEL PLATING WORKS, 68, 70 & 72 First St., San Francisco, Cal.

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JUSTINIAN CAIRE, Agent,

521 & 523 Market St., San Francisco,

—DEALER IN—

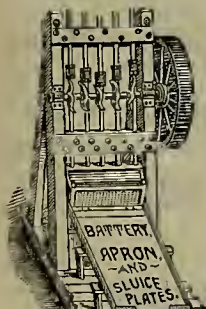
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—MANUFACTURER OF—

BATTERY SCREENS AND WIRE CLOTH

Agent for HOSKINS'

HYDRO-CARBON ASSAY FURNACES



IMPORTANT TO GOLD MINERS! SILVER-PLATED AMALGAM PLATES for SAVING GOLD In Quartz, Gravel and Placer Mining.

PRICES GREATLY REDUCED. ONLY REFINED SILVER AND BEST COPPER USED. OVER 3000 ORDERS FILLED. FIFTEEN MEDALS AWARDED. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated. These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Streets, San Francisco.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,

H. G. DENNISTON, Proprietor.

653 & 655 MISSION ST., SAN FRANCISCO, CAL.

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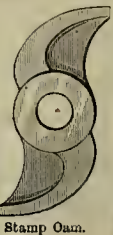
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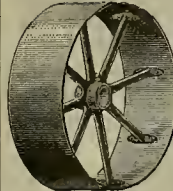
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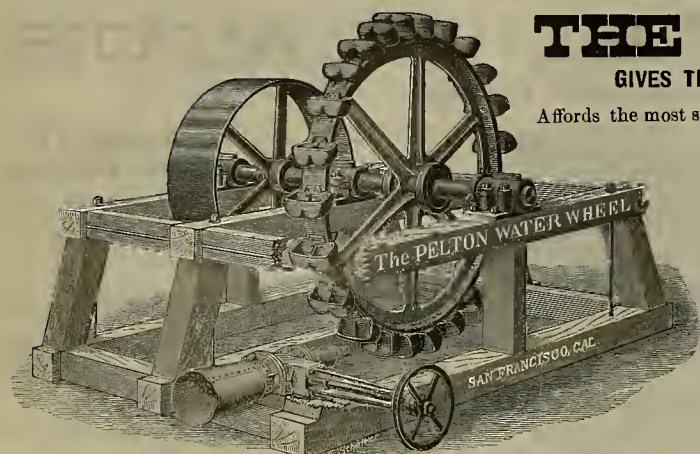
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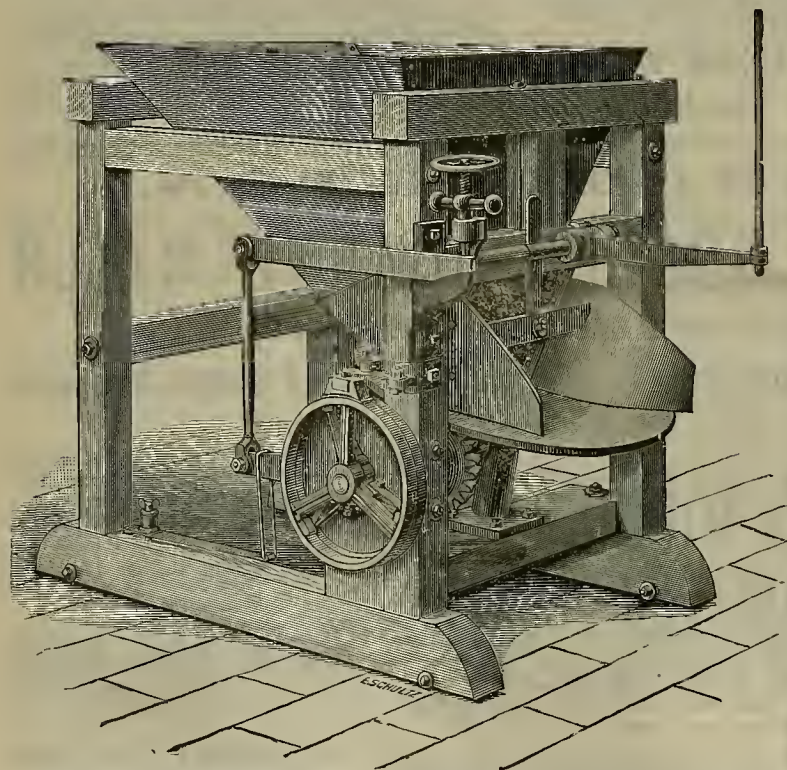
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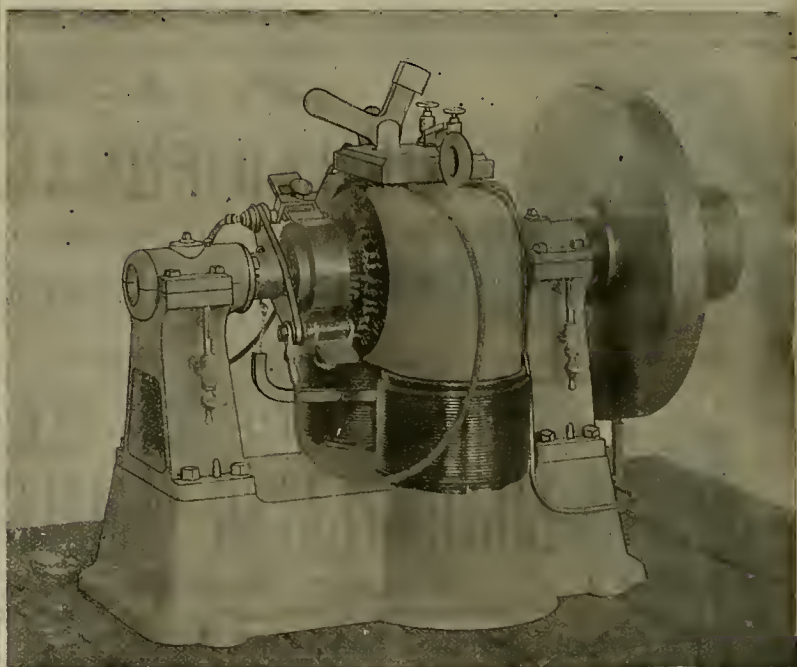
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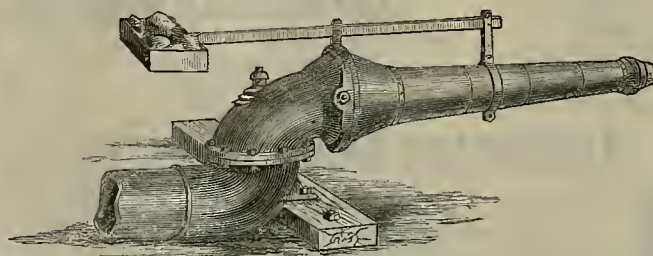
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 11.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 12, 1891.

Three Dollars per Annum
SINGLE COPIES, 10 CENTS.

The Pollok Gold-Extracting Process.

The special feature of the Pollok chlorination process is the method in which the chlorine is applied—a so-called hydraulic chlorination method, i. e., the chlorine, after being liberated, is liquefied by hydraulic pressure. The ore is first crushed and passed through a 30-mesh screen, too great fineness not being desirable. "Float gold" ores are brought at once to the chlorinating cylinder, but "refractory" ores are first roasted. One of the two chlorinating cylinders is made of light steel and is lined with a thin coating of india rubber which protects the steel from the action of the chlorine. It has an automatic valve for charging and discharging and a delivery pipe. There is also an escape valve on the top of the cylinder. The other cylinder is lined with wood. The rubber used for the purpose of lining the cylinder is about an eighth of an inch thick, and is made of pure rubber and not vulcanized. It is found that the chlorine has no action on the rubber, and that the wear and tear from friction practically amounts to nothing. It will be seen that the value of the india rubber lining is thus very great. The chlorinating cylinders are charged as follows: First, 80 lbs. of nitre cake, forming about two per cent of the whole charge, is dropped into the cylinder; then two tons of the ore, and, lastly, 60 lbs. of bleaching powder, or about 1½ per cent of the whole charge. The charging aperture is then closed and a steam injector is turned on, forcing in water till the pressure rises from 70 lbs. to 100 lbs. It is important that all the air in the cylinder should escape, as the presence of air is detrimental to the action of the chlorine, as it mixes with the gas and prevents its liquefying. The cylinder is then revolved, mixing up the ore with the bleaching powder and the nitre cake. The chlorine which is thus liberated, goes into solution, and the pressure forces the strong chlorine liquor into the ore, previously rendered porous by washing. The cylinder is revolved from an hour to an hour and a half, when the contents are discharged on a filter bed placed below. The waste chlorine is blown off and largely recovered by being passed through slaked lime and thus absorbed.

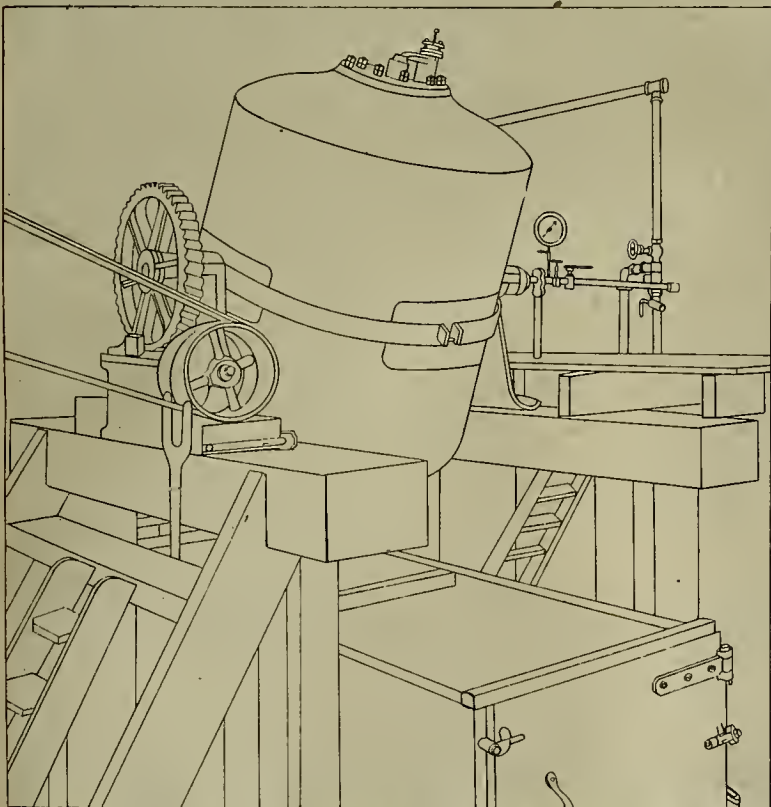
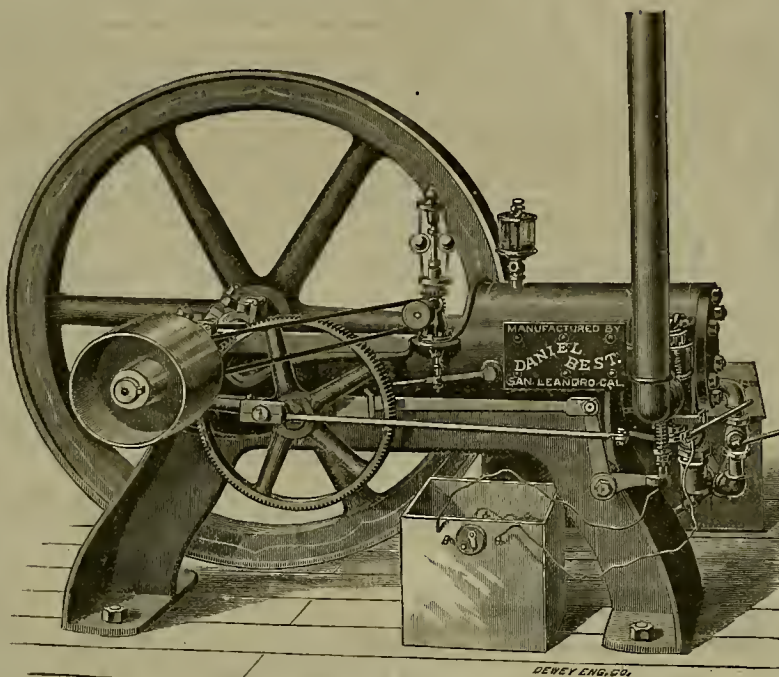


Fig. 1. - THE POLLOK NEW CHLORINATOR AND FILTER BED.



BEST'S IMPROVED GAS ENGINE.

The filter is made of steel wire lined with india rubber. The charge after being deoiled on the filter bed, is filtered, the chlorine liquor containing the gold is drawn off by a specially designed vacuum pump, by which it is pumped into the precipitating tank (Fig. 2), where the gold is precipitated by adding ferric sulphate. The quantity of re-agent used is about 30 pounds to the ton, or 1½ per cent. The precipitating tank is filled with a conical shaped bottom, on which the gold precipitate settles. As soon as the liquor has become clear it is run

off and the gold paste is removed and fused with borax into gold bars.

The chief advantages of this process, as claimed by the patentees, are: 1. The rapid and complete extraction of the gold by the use and application of hydraulic pressure, a machine weighing 25 cwt., being able to put through 24 tons or 12 charges, in 24 hours. 2. The use of dry chemicals which can all be safely and cheaply packed, shipped and carried. A very high percentage is recovered by the process.

Best's Gas Engine.

Daniel Best of San Leandro, the inventor of many agricultural implements, has devised a new gas engine, illustrated on this page, which he is confident is a very superior motor. He has been studying the use of gas and gasoline as a motive power, and by a series of experiments has determined the proper point to take advantage of the combustion of the gases. By the peculiar construction of the spark device, the electric spark can be produced at whatever position of the crank and piston-head may be desired. The ordinary machines can produce the spark only at one place, as they do it automatically by the cylinder head. Mr. Best says that by setting the device to spark at the same place as other gas engines, it required more explosive per minute than it does by his method and time of firing. This is the principal point in the new engine, and one which the inventor claims makes it a very superior piece of machinery.

ACADEMY OF SCIENCES.—The Academy of Sciences met Monday evening with Dr. Harkness presiding, but adjourned without transacting any business, in respect to the memory of Second Vice-President George Hewston, recently deceased.

REPORTS of rich strikes continue to come from the Pine Nut mines, Nev. yet some contend that there is, thus far, only one mine of value there.

THE Allison Ranch mine, which it is expected will shortly be again worked, has yielded \$7840,000 up to the time work was stopped upon it.

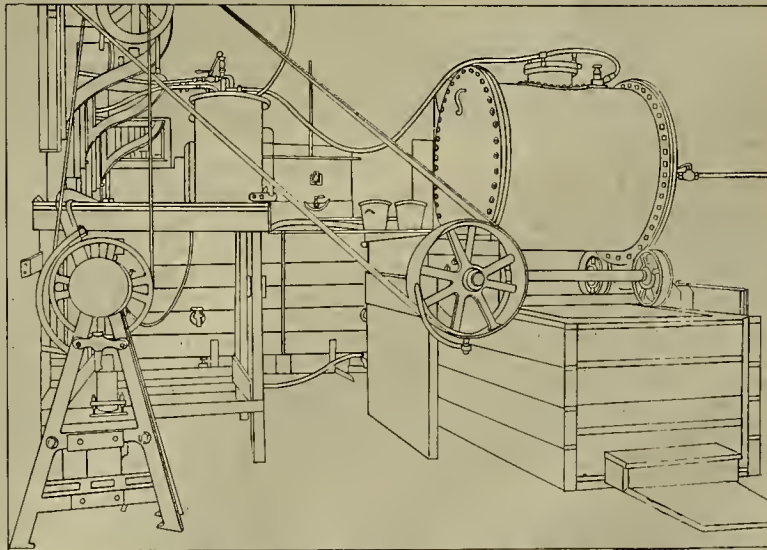


Fig. 2. - POLLOK ORIGINAL CHLORINATOR AND PRECIPITATING PANS.

CORRESPONDENCE.

We admit, unadvised, opinions of correspondents.—Eds.

Plumas County Mines.

(From our Traveling Correspondent.)

Plumas-Eureka.

The old Plumas-Eureka, T. W. Jenkins, superintendent, is way up at 7300 feet above sea level, on Eureka mountain, and just above the town of Johnsville. The mine is opened by five tunnels. Nos. 1, 2, and 3 are worked out. No. 4 is in 4000 feet and taps the vein 1500 feet deep at the deepest point. The average width has been 30 feet. No. 5 is now in $1\frac{1}{2}$ miles and idle. A shaft has also been put down from the bottom of the lower tunnel for a distance of 150 feet and drifts run 600 feet each way. All of this section of the mine is now idle. At this time ore is coming from the 76 vein. The old Plumas-Eureka vein is considered worked out. The 76 vein is opened by two main tunnels. No. 1 is 800 feet long and shows a vein of from one to six feet wide. No. 2 tunnel a crosscut, 600 feet long, taps the Hoskins vein. The ore from this vein is now the chief source of supply. A drift has been run on the vein 640 feet, showing vein of from one to six feet that averaged \$5 a ton. In working the ores, the cars are brought out by horses, and the ore conveyed down the mountain side by gravity tramways. There are three tramways; the two main ones are 1500 and 1700 feet long. The mill is of 60 stamps, crushing 2.6 tons a day per stamp. The pulp passes over amalgamating plates, then over old-style Hendy concentrators; it is then carried into a plate room and run over a system of plates, after which it passes down the creek to be worked by some 20 arrastras.

The Jamez.

S. W. Cheyne is superintendent of the Jamez M. Co. The mine is $1\frac{1}{2}$ miles south of Johnsville and $3\frac{1}{2}$ miles south of the Plumas-Eureka. The company's territory takes in 700 acres. The altitude of the mine is not quite as lofty as that of the Plumas-Eureka, being 5390 feet. In addition to the 700 acres of mineral ground, the company also has its own water supply which embraces the waters of Wade, Jamez, Rock and Grass lakes which now furnish 300 inches of water and can be increased to a far greater amount by converting the lakes into reservoirs by a system of embankments. The mine is opened by tunnel and shaft. Tunnel No. 1 is in 1700 feet and is intended to drain the shaft, the tunnel runs 800 feet on the vein and shows an average width of two feet; the shaft will intersect the tunnel at 165 feet. It is the superintendent's intention to work the mine through the shaft. Thus far the work is all of a developing character and the work will be continued for another year, or until the owners are satisfied they not only have a mine, but that they have sufficient ore in sight to feed a mill, before they erect one.

The Conelgnée.

This is a Pittsburg company that has been operating for a number of years on the gravel channel between Johnsville and Mohawk. They have got their tunnel in now and are making an appraisal for the channel which they expect to out the coming week. This channel is said to extend from La Ponte, in Sierra, to Genave, in Lassen county. Comparatively speaking, there is next to nothing being done on it.

Quincy.

Quincy is famous for her hotel, the Plumas House, which is not excelled, seldom equaled, in any part of the State outside of the cities. Once this county, "The Switzerland of America," is opened up by railroad, the Plumas House will receive the patronage, the hotel and the beautiful scenery of Plumas deserve. But to get back to the mines. The only quartz mine working in this vicinity is

The Golden Gate.

J. B. Sutton superintendent. The mine is situated eight miles west of Quincy. The vein was worked in the early days and reopened in June, 1890. The vein is almost flat and is stripped and worked in a five-stamp mill. So far, the vein runs from three to six feet and is being worked to a profit at this time.

Crescent Mills.

The Crescent M. & M. Co., A. W. Whitney superintendent, owns a mine in the town of Crescent Mills. The mine has been in operation since 1863, and has produced over \$1,500,000 in working to the 200-foot level of the different veins on the mine, which are five in number. They are gradually merging into each other in depth. The shaft is now going down to the 400-foot level. When down, drifts will be run and the different veins connected. The mill is of 34 stamps and the Crescent is the second mill in the county.

Green Mountain.

This mine, G. P. Cornell Supt., is just above Crescent Mills. The property has been in operation for over 20 years, and in that time has yielded over \$5,000,000. The Green Mountain is opened by six tunnels and worked out down to the fifth and a part of the sixth. The No. 6 tunnel is in about one mile and 400 feet and on the vein fully 1500 feet deep.

The vein runs from 20 to 30 feet in width of

ore that averaged \$7 a ton. The company has acquired the Cherokee mine, which adjoins on the west. This—the Cherokee—has not been worked below the 260-foot level. The drift from the Green Mountain will be extended 800 feet to out the Cherokee at its east end, where it will strike it 1600 feet deep. The Cherokee is known to contain two ounces of ore—one of 300 and one of 400 feet in length in the old workings. How much longer they will be in the 1600-foot level is a matter of conjecture. The mine has a 60-stamp mill, 30 stamps of which are running at this time.

The mills of Plumas county show the marks of age. That they all lost a large amount of gold is proven by the number of arrastras that outside parties run on the tailings from the mills. At the Green Mountain, 18 arrastras paid each \$1 a day for the privilege of working the tailings, and they only caught the free gold. Here, everything that was not free was lost. Mr. Cornell intends changing all that, and in time will have an automatic mill with all the modern appliances for the rapid, economical and efficient working of the ore. Once the Green Mountain gives up 85 per cent of her ore's value, instead of 55 per cent as heretofore, she will crowd the Plumas-Eureka for supremacy.

Greenville.

The Drury & Pacific mines, Geo. Standart, superintendent, are two miles south of Greenville and immediately below the Round Valley reservoir. The mines are opened by tunnels. The 1200-foot tunnel cuts the vein 275 feet deep and shows a width of from five to six feet of \$6 ore. A shaft is being sunk on the Pacific vein, which is 100 feet south of the Drury. Drifts will be run from this shaft to the Drury vein and the mine worked through the Drury tunnel, the shaft being used mostly for ventilation. The Pacific vein is from 12 to 14 feet in width of \$6 ore. The mine has a 20-stamp water-power mill, with 15 stamps in operation at this time. The company owns 320 acres, which gives it 3500 feet on the vein and a large timber tract. The owners have paid for the mine, paid its debts and theirs and developed the property from the proceeds of the mine, and only want time to accumulate a reserve sufficient to erect a modern mill at the mouth of the lower tunnel, which, by the way, is in 250 feet to the vein, 150 feet on the vein, and will come into the upper part of the mine 250 feet deeper than the present works.

Johnnie Bull.

S. Firnstone is superintendent of this mine, which is immediately below the Drury. The mine is opened by tunnels. No. 2 is in 270 feet, and taps the vein 50 feet deep. No. 1 is in 250 feet on the vein, which it cuts 120 feet. The vein is from 12 to 14 feet in width. The last ore milled averaged \$7 a ton. The mine has a five-stamp mill and should, when fully developed, have a 60.

Ophir Consolidated.

J. P. Hall is owner and superintendent of this mine. The Ophir is south of Greenville. The vein is opened by tunnels. No. 1 is on the No. 1 ledge and is in 140 feet, cutting the vein 70 feet deep and showing $2\frac{1}{2}$ feet of vein. No. 2 is in 150 feet and cuts the 18-inch vein 75 feet deep. Mr. Hall is perfecting a rotary quartz-mill, which runs so light that it can be turned and run by hand. When completed, he will work the Ophir ores with the mill.

Driving from Taylorville to Clover Valley, and just out of Taylorville, a range of mountains looms up, and for a long distance shows a bare and rugged side, where the successive snow-slides or avalanches have ground off the mountain's side. Near the summit of the mountain runs the mother lode, 12 feet in width. No prospecting has been done on it, though it crops boldly. A farmer living at the base of the mountain informed me that there was a number of other ledges running parallel and near the mother lode, and that the earth near the veins panned out well in very fine quartz gold. He further showed me some quartz that he had plowed up in his field below the mountain. The quartz was very rich in free gold. When other counties are scratched over from end to end by the prospector, it seems strange that this self-developed section should not even be examined. The snow has cleared off the trees, earth and all the surface rock down to several hundred feet in depth on the vein.

E. F. SCHAEFFLE.

Magnesia Works in Napa County.

EDITORS PRESS:—In going through the mountains in the vicinity of Upper Child's valley, your correspondent stumbled on what may become quite an important industry, and add to the wealth of Napa county as well as to the promoters of the concern. I refer to the magnesia works of Stanley and Bartlett. Mr. W. P. Bartlett, a former journalist, late editor of the *Livermore Herald*, is the manager of the works, and seems quite confident of the success of the enterprise. He assures me that he has contracts for all that they can produce, and as the works and the ledges are located where wood is practically inexhaustible, the ore can be calcined at a very moderate cost.

Mr. Bartlett informed your correspondent that the prepared product, which is practically pure magnesia, is used both at the iron works in connection with the smelting of iron and also by the manufacturers of wood-pulp, which

is now so largely used in the manufacture of paper.

It is to be hoped that the promoters of this enterprise will more than realize their most sanguine expectations. Wealth wrung from the unwilling bosom of the earth benefits many and wrongs no man. Many of the vineyardists in Napa valley are feeling blue over cheap wine and infected vineyards. Let us hope, for the sake of those who have been thus unfortunate, that the future will prove that the quail in the mountains have been roosting over more wealth than has ever been squeezed out of the grapes in the valleys.

The success of this enterprise would be a great boon to the farmers in the vicinity of the works, as it would make a home market for a large quantity of grain and wood. Work was commenced about two months ago, and the furnace was started August 24th.

Rutherford, Napa Co.

The Band Saw.

EDITORS PRESS:—Twenty years ago we thought the band saw the saw of the future. At Eureka, the other day, we saw one that had been constantly in use for 13 months cutting as much lumber as the big double circulars, and turning out nine boards where they cut eight. Mr. Flanagan pointed to his pile of sawdust and said: "I have just been figuring that there is \$100,000 that would have been in my business now, had I put in this band saw 15 years ago." Other mill men reported that band saws were being put in as fast as new mills were built or old ones burned down. Mr. Flanagan insists upon it that they cannot afford to go on cutting an eighth of their lumber unnecessarily into sawdust. That eighth represents a good profit. He has ten hand saws with his outfit. Each is ten inches wide, 56 feet long and about one-eighth inch thick. He has an emery machine that sharpens the teeth mathematically and another equally accurate in swaging the points. Still another device grinds the end down to a feather edge to make an eight-inch lap that when braced together is no thicker than the balance of the saw. Then it must be so hammered that it will be plane as it lies on the block, but concave as it is raised. Some of these little points were the last things to be learned to make a hand saw run steadily and never huckle.

Now the lumber is so true and accurate that dressing in the planer only takes very little off, and the corners fit the try square.

Mr. Flanagan claims there is less saving in power than he expected, but that he gains an eighth in lumber and produces a better quality. The mills are rather quiet now, owing to a limited demand, and are anxiously seeking new markets. There remains 500,000 acres in Humboldt and large tracts in Mendocino and Del Norte of redwood timber land that will scale according to surveys of experts, fifty to seventy thousand feet of merchantable lumber per acre.

FRANK P. CHAPIN.

GRAVEL CHANNELS.—The Ruby Company is reported as putting in a slope to work some portion of their ground which is below the tunnel running south. If we understand the situation, the channel at this point pitches to the northeast, toward the secondary, or deep channel crossed by the old Extension tunnel. The Ruby's main works are now supposed to be in the upper secondary channel, below the altitude of the old Bald Mountain channel, and above the Ruby channel proper. There seem to have been three distinct and separate channels at this point. The first, or upper channel, (old Bald Mountain) ran from north to south; the second, (the B. M. secondary or deep channel) ran southwesterly at this point, crossing the upper channel at an oblique angle; the third or lowest, (the Ruby, or Extension deep channel) running in a southeasterly direction, crossing the Extension and South Fork claims. The gold now being taken out by the Ruby was originally freed from its quartz matrix in the upper or primary Pliocene channel, being precipitated to the lower channel by erosion. Later, this second channel was cut off by the third channel, hence the slope towards the east may be found very much distorted by erosive action towards the lower channel. In the course of time, if this second channel is explored far enough to the southward, it will present the apparently anomalous condition of running both ways. Such another instance of the channels of the different Pliocene periods crossing each other, as is here presented, has never before come under our observation. The attention of the glacial theorists is respectfully directed to nature's record of its works at this point.—*Mr. Messenger*.

SISKIYOU BLUE GRAVEL.—The Yreka Blue Gravel Mining Co. is now more sanguine than ever that it is opening up a good mine. The opinions of all leading mining experts who have visited the mine, is that it will certainly be a successful venture, and that the owners will uncover immense wealth when they strike bedrock. Work is being steadily pushed forward and it is only a question of a very short time when they will demonstrate to the public that immense bodies of rich gravel lie buried up in this country, and that all it lacks is enterprise and capital to give Siskiyou one of the greatest mining booms that she has ever experienced. The Yreka Blue Gravel Co. is composed of men of enterprise, and deserve to succeed.

About Butte County Mines.

The letter below, which was received last night, explains itself, says the *Oroville Mercury*. It is published for several reasons. First, because it is probable that some of the miners may answer the questions by letter better than the *Mercury* can. Second, it shows that the mines of Butte and Plumas counties are attracting attention. Third, it is complimentary to the *Mercury*, as it shows that the paper is in touch with the great mining journals of the country as well as the mining capitalists. Here is the letter:

Editor *Mercury*.—DEAR SIR: In the *Engineering and Mining Journal* of New York, August 1st, there is an article copied from your paper giving the production of the Spanish Ranch district since Wells, Fargo & Co. have been in existence. You place it at over \$25,000,000. The article attracted my attention and I take the liberty of writing you with a view of getting some information about your section. What I would like to know is this: In your opinion, what would the chances be for a few practical mining men with limited means, 1st, as to prospecting; 2d, as to leasing; 3d, as to wages. As to prospecting, is the whole country staked? as to leasing, is there any of it done? if so, the average royalty paid. Please state what wages are, and is the country overrun with men. Are the mines wet? Can the mines be worked all winter? and any general information as would be of interest to a number of men thinking of making Northern California their home. Now, if you will kindly take the trouble to answer this, you will greatly oblige yours truly,

Silver City, Utah.

R. C. FAGER.

In a general way, the *Mercury* answers that the mines of Butte and Plumas offer the most flattering inducements to practical miners, with or without capital. There is more prospecting being done now in quartz and gravel than ever before. There are abundant opportunities to buy rich ledges and gravel claims which have been efficiently developed to prove their wealth, but upon which the owners are unable to place the necessary machinery. The *Mercury* has recorded new and rich finds nearly every week during the past year. As a rule, our mines are easily worked. Miners' wages run from \$2 to a much higher sum, according to intelligence, capacity, reliability and experience. Some leasing of ground from large companies has been done, but it is not a feature of the industry.

Again, we say that the mines of this section are yet in their infancy, notwithstanding the millions that they have so generously yielded. To the practical, energetic young miner, no more inviting field is known to exist anywhere on earth; but a man can't scoop up the gold on the surface. The early miners did that by the bucketful, but they merely skimmed the surface. Hundreds of quartz and gravel mines are now being developed in Butte and Plumas, and while some have lost money on ventures that were ill-advised and poorly managed, the great majority of the mines have paid. Mining in these two counties is sure to give employment to thousands more men than at present, and that in the very near future; hence we conscientiously believe that the young man who has strength, courage and a little capital can find opportunities in our mines that overshadow any others offered in the West.

The Oil Wells.

The California Oil and Gas Development Co., says a Los Angeles exchange, operating on the Mansfield ranch, three miles west of town, on Sixth street, have the derrick up, with the boiler and engine nearly in place. After a few more days of preliminary work they will be ready to fire up and set the drill in motion.

The Washington company has some men at work on its lands in the Tonsley canyon, near Newhall. They are making roads and numerous other preparations for beginning active developments in the early autumn. This company got a pointer from the P. O. Co. a few days ago, by this latter striking a fine well in the Wiley canyon, which adjoins them on the east, the new well being situated about a fourth of a mile east of the Tonsley claim.

Another good bit of news comes from Ventura county. A 200-barrel well has been struck by the Union Co., in Adams canyon, about four miles northwest of Santa Paula. The well, it is said, was located by Dr. Crandall of Pasadena. It is in a new ledge.

The Sunset No. 4, in Hopper canyon, reported last week as a 20-barrel well at a depth of 180 feet, is now said to be a 60-barrel well at a lower level.

At the Baptist College the West End Co. is pumping steadily. As soon as the treasury is replenished, boring will go on again.

At Huron things remain as before reported. The oil is very light, and a wick dipped in it burns almost without smoke. It is still claimed to contain paraffine.

It is not generally known that the first carload of naphthalene ever shipped West was sent from near Santa Barbara by W. H. Burns, the handsome proprietor of the Nadeau. This was away back in 1884 or thereabouts. Mr. Burns is about the best posted oil man in this section.

—E.

ONE OF THE LATEST APPLICATIONS OF ELECTRICITY is in the direction of surgery. It was invented by an Englishman, and consists of a soft iron core surrounded by a coil of insulated copper wire, the pole pieces of different shapes being screwed into the end of the core. A battery of bichromate cells furnishes the current. By means of this instrument it is said to be

possible to remove bits of steel or iron from the eyes of workmen, without laceration, which must, necessarily be the case where the probe or forceps are used, and also to locate and remove bits of metal from different parts of the body, where they may be located, and also can be made useful in drawing such metallic substances from inaccessible or dangerous positions to those more favorable to removal, and it has already been tried in several cases for the removal of needles and other objects from persons thus afflicted, with excellent success.

Prospecting.

The indefatigable prospector for the alluring minerals that lie hidden beneath our rocky mountains is the true pioneer in the fullest sense of the term. With his patient little burro, a sack of flour, a side of bacon and his mining tools, the fearless prospector leaves behind him all of the comforts of civilization, his wife and baby, and following the guiding star of Hope, trudges over rugged mountains and crag-locked cañons, stopping here and there to break and eagerly scan a promising bit of flat or wash a pan of dirt where he fancies he has caught a glimpse of color. Days follow days, and still he wanders onward, farther and farther into the depths of the wild, unbroken maze of nature's rugged handiwork. As the sun sinks behind the snow-capped ranges which rear their lofty heads far above him on every side, he turns his weary companion loose to crop fresh bunches of the tender grass, and lighting his little campfire, cooks his frugal meal, his busy brain weaving wonderful projects of future comfort and plenty for the loved ones who are anxiously awaiting his return, and, worn out at last, he rolls himself in his blankets and beneath the star-spangled canopy of blue sinks into a dreamless slumber, only to awaken and renew his toilsome search for gold.

If Dame Fortune smiles upon his efforts and he returns to his loved ones with the fruits of his arduous toil, hundreds of eager seekers alter the golden spoil follow in his footsteps, and another town is added to the long list of mushroom camps which form the advance guard of civilization. But unhappily, how many of these hardy treasure seekers spend days, months and years in vain search for a short road to silence, only to lay down their quartz-worn pick and spade beside some promising ledge that failed to pan out in paying quantities, and, like the way-worn prospector's life, pined out just as its promise was fairest; and when the snows of winter have melted away under the genial influence of another summer's sun, a rusty pick and spade, a little heap of gold-sprinkled quartz and a ghastly skeleton, bleached and fleshless, are all that is left of the loving husband and father who left his home and family in the vain search for gold. So it is through every man's life, whether the search be for gold, for love, for glory or for fame, some prospectors, with scarcely an effort, are showered with favors by the fickle goddess, while others may toil early and late, endure heart-breaking deprivations and incur the ridicule of mankind only to find, when "life's fitful dream is o'er," that a harvest of chaff and a house built upon the sand is their only reward.—*Silver State.*

Wood River Mines.

The Wood River country, says the Ketchum *Keystone*, has been in disgrace now for a good many years, but there are many and very encouraging indications of a renewal of something like its old prosperity. Of course the initiatory steps had to be taken by our own citizens. Only by their energies and enterprise, and by a practical exemplification of their confidence in the worth of our mines, could the general public be induced to reverse its unfavorable judgment in regard to the section; for confidence had by some means been destroyed, and few could be found who believed there was anything on Wood River beyond a few surface pockets, which it was popularly asserted had been "all worked out." A small number, however, continued to have faith. These remained in the much maligned "digging" and worked away as best they could, and their labors and faith seem now in a fair way to be rewarded, and well rewarded. Halley is already taking out and shipping more ore than ever before since the town was built. Depth has been attained on some of these mines—notably the Red Cloud, Red Elephant, War Dance and Porter Brothers' mines—which have proven permanent and very rich. At Eat Fork, better prospects are being obtained as the shafts go deeper into the earth, and there is now an apparently well founded rumor from them of a strike that will be a surprise when its magnitude is known. At Boulder, the Trapper is developing splendidly. Boyle Mountain is improving daily and will soon be recognized as the best mining section of all this region. Smoky, Galena, Sawtooth, Vienna, Seafoam and the East Fork of Salmon, each and all, are yielding good ore, and nearly all of them in increasing quantities. All of these indications, with the promise of the early completion of a railroad line from Boise City to Butte, which will supply cheaper and speedier transportation facilities for the ores of the country, and lastly, the fact that Ketchum will probably ship as much or more ore this year than ever before, point inevitably to an early and permanent renewal of mining, and a resultant long series of years of prosperity for Wood River.

Revival of Mining in Calaveras.

The Calaveras *Prospect* says: More interest is being taken in mining matters in this county at the present time than for many years, and with brighter prospects. While much of the work is still in the line of exploration, the fact that more mines are taking out pay dirt at the present time than for years before has greatly stimulated the opening of new ground. Many mines that have been prospected in years past and abandoned as worthless have been taken hold of by determined men, and the work of exploration extended till bodies of ore have been exposed that elude the croakers and show conclusively that many of these old mines have never been half prospected. A country that has been so rich in placer gold as this has been is bound to contain large deposits of metal-bearing rock, and it only requires a little nerve and money to find it. The search for gravel channels has but just begun in this county, and we believe that the near future will show that there are many old channels here that have hardly been suspected to exist. The exploration alone in that line during the past six months and the gold taken out in some of the workings certainly warrant this assertion. It is probable, however, that quartz will still continue to be the great attraction for the prospector. With the new processes for working rebellious ores and saving the gold, old mines, considered worthless, will again come to the front, and new mines will be developed. The results in the Woods mine on Indian creek and the Quaker City mine near the Junction are good examples of what can be done with old mines.

The result of the last six months' work is surely encouraging. Another thing that is largely aiding in the development of mines is the fact that mine-owners are beginning to see the folly of asking fabulous prices for mere prospects. The kind of men that make mining pay, and build up a country, are not the ones that buy simple holes in the ground for a fortune, or bond an undeveloped ledge for the price of a well opened mine, and do all the opening at their own expense.

Mining is assuming, more and more every year, the character of legitimate business, and the purchaser wants to receive the worth of his money. A man may be willing to risk a few thousand dollars on a prospect, who would not think of looking at it were several times that money asked. Prospectors and mine-owners are coming to see this, and are asking more reasonable prices for their holdings, and as a result are selling them, at a fair valuation to themselves for the work done, and are at the same time giving the purchaser a chance.

Rich Asphaltum Deposits.

The Ojai Asphalt Co.,—a home company, says the *Ventura Free Press*, composed of W. F. Sherwood, Pres.; Joseph Roth, V. P.; J. S. Collins, Treas.; H. Metcalf, Sec.; and J. S. Briggs—is the owner of several deposits of asphaltum in the upper and lower Ojai valley, of which it is at present working the one in the lower valley located on the hill opposite the noted Theacher orange grove. The latter deposit covers an area of 1½ acres, is from six to eight feet in depth and supposed to contain fifty to sixty thousand tons of crude material. The purpose of the company is to extract a nearly pure asphalt from this crude material, under the belief that the time has arrived when there is a market for it. Hitherto it has been the practice in cities as well as towns to allow contractors to make so called asphalt streets and sidewalks of any sort of material which they could persuade the authorities was suitable for the purpose; but time and experience has shown that such street pavements contain too small a percentage of asphaltum and a vast deal too much of deleterious substances. By this experience, city authorities have come to prescribe the percentage of asphaltum and the quality and cleanliness of the ingredients with which it shall be mixed. The output of the company, which is very near pure and therefore lighter than any other variety per cubic foot, is being prepared with a special view to meeting these new requirements. At the mine it will be readily seen that no transportation expenses upon waste or dross will be incurred. It is the first undertaking of the kind in California, and in the confident belief that while they may be a little in advance of the times, they are certain ultimately to place the undertaking on a remunerative footing. This mining camp on the hillside overlooking the beautiful Ojai valley gives the visitor rather the impression of a picnic ground. The owners have liberally provided commodious buildings for their employees beneath the broad-spreading live oaks, and have supplied every facility for carrying on the business in a thorough and business-like manner.

There are a multitude of uses for asphalt, the largest of which is making street pavements, but enters into the manufacture of coach varnishes, paints, roofings and preservatives, and gives a bright glossy surface to patent leather. It is shipped in open-top boxes 12x12x22, convenient size for handling. It has been submitted to leading manufacturers in the East and was pronounced by them to be superior to any they have seen. Occasionally a shipment is made in barrels containing from 350 to 400 pounds. These mines and their productions should be talked of by all our citizens when visiting elsewhere, and should have the encouragement of all at home. F. M.

Speed is the manager at the mines, Frank Tracy superintendent of blasting, and L. L. Bridger team boss.

Gold and Silver Process.

Mr. Montgomerie, of Dalmore, Ayrshire, in conjunction with Mr. Henry Parkes of London, have discovered a process for the extraction of gold and silver from the refractory gold and silver sulphide ores of the Champion mines, in the Thames district of New Zealand. These ores are well known to be of a very refractory nature, and all the processes now in use have failed to treat them satisfactorily. The best results that have been obtained in former trials were by a process which took 16 hours in treatment, with an extracting power of from 85 to 87 per cent of gold and from 72 to 86 per cent of silver. During the past few months Mr. Montgomerie has personally carried out a large number of experiments at his "Tam o' Shanter" House works on this ore, with the result that he has reduced the time for treatment from 16 hours to 4 hours, and with an extracting power of from 95 to 99 per cent of gold, and from 90 to 95 per cent of silver. From trials on two special grades of the Champion sulphide ores the following results have been obtained without the ore being calcined: Ore assaying 1 oz. 1 dwt. 11 grains gold, and 39 ozs. 4 dwts. 21 grains silver, 98 per cent of the gold and 93 per cent of the silver extracted; and from ore assaying 2 ozs. 9 dwts. gold and 59 ozs. 19 dwts. 7 grains silver, as high as 99.62 per cent of the gold, and 95.39 per cent of the silver have been taken out. In working out the best method for the treatment of these ores a number of valuable data have been arrived at, whereby the ore can be brought to yield up its precious metals, and some of these are specially adapted for certain refractory ores other than those of the type of the Champion ores. It is believed that one or the other of the processes which have been discovered will treat a wide range of the various ores which are now but indifferently treated, and those of a slightly refractory nature may be treated easily with the highest results.—*The Ayr Advertiser.*

SHIPMENTS OF QUICKSILVER.—During August, flasks of quicksilver produced at the mine were shipped from Calistoga to San Francisco as follows:

Napa Con.....	463
Gr Western.....	259
Bradford's.....	141
Sulphur Bank.....	164

Total for the month.....967

The Napa Consolidated mine is producing remarkably well and adds in making the total amount for the month unusually large—greater than during any month within the 24 years ending August 1st last. In January, 1889, the total shipments were 972 flasks, or 15 flasks more than for the past month. The August product of the four mines above mentioned amounts to 73,210 pounds, and at present quoted prices is worth over forty thousand dollars.—*Calistogan.*

BROKEN HILLS.—The annual report of the operations of the Broken Hills Proprietary Mining Co. of New South Wales for the half year ending June 30, 1891, shows results including, in the first place, an actual money return of \$5,531,000 from the sale of silver and lead bullion, with a gross profit of \$3,049,000 to be added to the money already in the treasury—\$1,516,000. Dividends were paid to the aggregate amount of \$2,806,000, leaving the balance in the treasury of \$2,735,000. Up to the 30th of June, 1891, the total output of this property has been \$28,798,000 at a cost of production of \$13,778,000, including sums written off for depreciation of plant. The product to that date has been: Silver, ounces, 25,750,000; lead, tons, 107,038.

FOREIGN COMPANIES IN CALIFORNIA.—Attorney-General Hart has under consideration the question whether or not a corporation organized outside of California can own railroad franchises in the State? The question, the Attorney-General says, is asked by a railroad company that designs to lay tracks to this city and become a competitor of the Southern Pacific. The Attorney-General says the question must also be decided for the benefit of certain street railways and other corporations. If they can own a franchise here how are they to be controlled by the Legislature of the State? Every corporation doing business in this State outside the power of its franchise is liable to a fine of \$5000, so says the Attorney-General.

A RARE SPECIMEN.—Mr. J. S. Whiteman of Cajon, in this county, is the fortunate possessor of a portion of the lower jaw of a mastodon maxilla, left side. It is 27 inches long, but was broken into two parts by the plow which raised it at the time it was found. This portion of the jaw is 7½ inches broad and five inches thick and contains one grinder tooth and a portion of two other teeth. The longest diameter of the top of the grinder (anterior posterior) is 7½ inches, while the shorter diameter is 3½ inches. This specimen was found while constructing the Santa Fe railroad through that part of the pass.—*San Bernardino Times-Index.*

A SIX-INCH vein of coal has been struck near Del Mar, San Diego county. The lignite comes to the surface.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

EL LEOPOLDO G. & S. M. CO., Aug. 28. Capital stock, \$1,000,000. Directors—F. Chappet, J. F. McCarthy, L. Bazet, D. E. Hayes and John Morton.

MCGO BAY IMPROVEMENT CO., Aug. 28. Location, San Luis Obispo Co., Cal. Capital stock, \$300,000. Directors—L. P. Branch, L. F. Gilmore, J. G. Scribner, G. W. Schell and L. J. Shank.

WATSONVILLE CREAMERY AND CATTLE CO., Aug. 28. Capital stock, \$100,000. Directors—J. Loud, F. J. Koster, W. Maison, M. H. Weed and B. J. Hoffacker.

HANFORD PARK AND TRADING CO., Aug. 31. Capital stock, \$100,000. Directors—I. H. Jacobs, N. Manasse, J. Manasse, S. I. and K. Simon.

SUNSET VINEYARD CO., Sept. 2. Capital stock, \$80,000. Directors—M. M. Johnson, J. W. Busbaker, M. W. Upton, E. E. Bush and C. T. Bridge.

LATHROP-FLINT CO., Sept. 2. Object, to carry on a land business. Capital stock, \$150,000. Directors, E. P. and G. M. Flint, C. F. and C. G. Lathrop and R. M. Lyman.

River-Beds and Tunnels.

A new river-bed mining scheme is proposed at a point between Hamptonville and Millerton on the San Joaquin river in Fresno county, where they are talking of making a tunnel, so the water may be diverted from the old bed. There has always been a tradition among miners that the bed of the river at this place is exceedingly rich in gold. The channel is filled with sand-bars. The bedrock is of granite. Along both banks placer mining has been carried on for 40 years and many rich patches have been found. The water of the river always prevented miners from prosecuting the work farther than the low-water mark. The bedrock dips toward the middle of the stream beneath deep deposits of sand and gravel. The farther toward the center men have been able to go the richer the deposits found.

Within the past week claims have been located all along the river, and where the channel is supposed to be rich. A survey has been made with a view of turning the river so as to leave the channel in a condition to be worked.

Wlogdamming a river is a common way of getting at the bed at a certain point, and is still practiced at many places in this State. Plenty of money has been made by mining on this system. But diverting the river by a tunnel is a pretty expensive job and thus far no money has been made at it. The two largest schemes of this kind have promised returns for some years, but up to this date the returns have not been what was expected by any means.

FINE GOLD IN PLACERS.—It is the experience of every observant miner that a large quantity of fine gold is not saved in ordinary hydraulic processes, even where the undercurrents are used. For years inventive minds have been experimenting in the effort to discover a method that will prevent this waste. During the past two or three years substantial progress has been made, most of the experiments being on the line of eliminating the heavy gravel, saving the fine sand and silt, and treating this residuum with an amalgamating process, by which means great economy is accomplished in the amount of water required and the flour gold saved. The *Journal* believes that some of these processes will, in time, be eminently successful. A recent inventor in the field is Henry Hartman, of Ogden; concerning his invention the *Salt Lake Tribune* says:

"It is a machine for saving the flour gold of Snake river and experienced mining men regard it with great favor. A test was made a few days ago in the presence of a number of mining men with sand from Snake river, and as far as could be observed the test was a success. Gold was obtained from the pan in minute quantities. The point of the invention is saving the water with which the sand is washed. The sand is screened through four graded screens and goes into a hopper, where the water is turned on, and from there goes into the jigger. The sand is deposited, thoroughly washed in another hopper, the water passes into a receptacle where the sediment is allowed to collect and is then treated. Mr. Hartman claims that his machine will solve the question of saving the great quantities of flour gold in Snake river."

COIN IN THE SUB TREASURY.—Assistant Treasurer of the United States J. P. Jackson reports cash on hand on August 31st as follows: United States notes, \$50,213; national bank notes, \$7585; gold certificates, \$2640; silver certificates, \$297,040; gold coin, \$46,047,669; standard silver dollars, \$21,589,426; subsidiary silver coin, \$4,543,269 65; minor coin, \$10,091.15. Total, \$72,547,953.80. Shipments during August, \$319,938.

THE BEAR VALLEY WATER CO., San Bernardino, has commenced work on its new dam, to cost \$500,000. It will require two years to complete the dam to 80 feet. Wm. Ham. Hall is examining the Bear Valley water system, and will soon report on the same, in connection with the Alessandro and Perris irrigation districts.

THE Congressional party has been successful in Chili, and the war closed. In a short time mining and other work will again go on as usual.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SULPHURETS.—Amador *Ledger*, Sept. 3: The sulphurets from the Hardenburgh mine at Middle Bar are being shipped to the reduction works at Sutter Creek. W. H. Miller, manager of the Huntington roller quartz mill, came up from San Francisco Monday night to see about the erection of the large mill of this make on the New York claim in John Bull gulch, below Jackson. His principal business was to ascertain if he can get the necessary lumber from the mills here. The machinery will probably be shipped from the city next week, as they will not be ready for it before then. The two-stamp mill has been running on the Mello and Questa claim at Jackson Gate for three weeks. A. Mello informs us that everything points to a satisfactory yield, although no regular cleanup has been made, and none will be made until a full month's run has been had.

SUTTER CREEK.—The mining industry in this vicinity is progressing favorably. The North Star is the only point that wears a discouraging aspect. In drifting, they have reached the boundary line of the claim, and some distance over. The ground is found to be harder and less encouraging than at any time in the past. In all probability the last assessment has been levied, as many of the stockholders think the ground has been pretty thoroughly prospected, and are loth to put any more money in the venture. Surface work at the Hector is drawing to a close, and in a short time they will be ready to commence the repairing of the shaft. The elevator that is being put in at the mill is almost completed, and will soon be ready to raise the ore from the ground to the mill dump above. In the meantime the mill is kept running steadily. Sinking is going right along at the South Eureka, and the ground is of a nature to admit of rapid headway being made. At the Belmont, a steady improvement is noticeable as developments proceed.

Butte.

BIG BENO MINE.—Oroville *Register*, Sept. 3: Forty miners are now employed at this mine and two localities are being worked, one is at Island Bar near the foot of the mine and the other at Huff's Bar at the upper end of the mine. The two places are 10 or 12 miles apart. At Huff's Bar they are stripping an ancient river channel on which large white oaks are now growing. The section that is being cleared is about 40 feet up and down the stream and some 60 feet across it. The gravel here is from 20 to 25 feet deep and this must all be removed by wheelbarrows before the pay dirt can be reached. This pay dirt is from three to five feet deep. The rocks are removed by powerful hand-derricks or cranes, while the mine is kept dry by means of a steam pump. To get this engine to its place it was necessary to let it down the mountain half a mile on skids. At this place 30 men are at work under L. Wakeman, but we are not able to learn the amount of gold that is being taken out. On Island Bar there are ten men under James Rowe and they are working in the bed of the present stream. The mine is kept dry by means of a China pump run by an overshoot wheel. They expect to strike pay dirt at this point in a few days, and it is hoped that something rich will be found. We obtained these facts from A. K. Beatson, the superintendent of the mine who was in Oroville a few days ago.

Calaveras.

A NEW MINING ENTERPRISE.—Calaveras *Prospect*, Sept. 5: The Home Stake and Golden Reef quartz mines on Indian Creek near the famous Cluniff mine, are about to be worked in a systematic and thorough manner. These mines have been owned and worked for some time by George Hengen and others, and extensive prospecting has been carried on. Lately a company has been incorporated in San Francisco to push the work on both mines. Most of the shares of the stock are held by wealthy San Francisco parties. Preparations are being made rapidly, and in a few days quite a large force of men will be at work.

CAMPO SECO.—The reports from this section continue favorable. A large force of men is continually at work taking out ore and on the extension of the works. We learn that as these works are completed, more men will be employed. Mr. A. Shaw of San Domingo, who recently relocated the old Green claim near Macaroni Flat, has been prospecting that ground with good results. We learn that at a depth of 60 feet, very rich rock has been found with a well-developed vein.

BIG FLOW OF WATER.—Calaveras *Chronicle*, Sept. 5: In the Quaker City mine a big flow of water was struck last Saturday. The shaft is down between 500 and 600 feet. The water came in while the men were off shift. Within an hour's time the water rose ten feet in the shaft, and in 24 hours it had risen 125 feet, where it appeared at a standstill. Owing to the water being turned out of the Campo Seco canal, which furnishes the motive power for the mine, the work of taking out the water has been delayed for a few days, but as soon as the water is turned on the work of freeing the mine will be commenced.

SPLENOIT ROCK.—Some specimens of exceedingly rich rock are on exhibition on Main street. The rock is from the mine of S. S. Moser in Tunnel Ridge. Mr. Moser's property makes an extraordinarily fine showing.

El Dorado.

GOOD REPORTS.—Georgetown *Gazette*, Sept. 3: Good reports come from the Darling mine as the shaft goes down. C. H. Langley, careener and millwright, is engaged in putting up a Kendall mill for the Beatrice Bros. on their Canyon Creek mine, about a mile north of the Armstrong & Ritchie mine.

GRAVEL.—Reports come from Volcanoville this week that Mr. Everts has struck into very rich gravel in his tunnel, which he has been driving for a long time at considerable depth to tap the ancient river channel.

LEASED.—The famous old Parsons mine, north of town, has been leased by John H. Anderson for three years. Mr. Anderson has gone to Santa Rosa for a couple of weeks, when he will return and begin the work of equipping the mine ready to start up

business after the fall rains. He will put in 1800 feet of sluice boxes and lay 400 feet of pipe to convey water to a nozzle for washing the ground into his sluices. This is a commendable enterprise and properly managed, is sure to prove profitable.

Fresno.

NEW OIL WELLS.—Fresno *Republican*, Sept. 5: A workman who has been assisting the well-borers in the west side region of Fresno county, was in town yesterday and reports a remarkable find of oil. He says that for some weeks past two experienced well-borers named Tierce and Lauer of Los Angeles have been at work about ten miles north of Coalinga, on land owned by San Francisco and Los Angeles capitalists. He corroborates the report received from two other sources last week. The flow of petroleum oil struck by the borers is in a black slate formation, 267 feet from the surface, which flows out of the top of the well. They went down about 40 feet farther and have suspended work in a rock, which they say is simply a large boulder and not bedrock. Agent Craig, of the Standard Oil Co., has visited the well and examined the oil, which he pronounces 82 per cent. Work on the well has been temporarily suspended in contemplation of a trade now being negotiated between the owners of the well and the Puente Oil Co. of Los Angeles. It is understood that several Frenchmen will leave here tomorrow for further investigations in the oil district to the west. Small oil wells have been worked there for a year or more, but the present flow is the largest one yet recorded.

Nevada.

BROKE INTO THE OLD WORKS.—*Transcript*, Sept. 4: At 2:20 o'clock yesterday afternoon the main drift of the Harmony Mining Company broke through into the old mine 1100 or 1200 feet north of the new incline. Wm. Osborne and M. Mitchell were in the head of the drift and the big body of water in the old works began to pour in on them. They beat a hasty retreat, falling down twice, but managed to keep ahead of the water. Mr. Osborne left his dinner bucket behind and the watches of Foreman McCoy and Robert Holland are in the drift where their owners left them. The new works are flooded and the water comes up into the incline. The work of bailing it out has begun and as soon as it is completed the company will explore the old mine which they have been driving to reach.

Plumas.

LONE STAR.—Plumas *Co. Bulletin*, Sept. 2: This property, recently sold by L. V. Tefft to an Oakland Co., consists of 160 acres near Cromberg. It breaks into the Middle Feather. It was operated last spring but is now idle. Although a placer mine, all debris from it is dumped on a flat. When first enjoined, Mr. Tefft says he was making \$100 per day. The present owners will make extensive improvements and by drifting will open up a large body of gravel.

THE RICH GULCH owned by Wm. Langhorst and Thos. Hartley is on Poplar creek, seven miles from Cromberg. It has been worked during three summers. Just a few days before our visit a \$45 nugget was found in the mine. The owners consider their prospects good.

NIGGER BAR.—Frank Johnson and Henry Baker are working a river claim here. The fluming of the river has been completed and work on the channel is now in progress.

THE CONSIGNEE.—This property is owned by a Pittsburg Co. and they have been operating it during the past eight years. The tunnel is driven into the hill on the east side of the Feather river canyon 2200 feet, and Mr. Trayner, the superintendent, expects to break into the channel any day.

MAYN & BENNETT.—These gentlemen are opening up the same channel as that sought by the Pittsburg people, about two miles from the Consignee. They have drifted 350 feet and believe they will soon break into gravel.

THE OHIO is operated by Nickrem & McKenzie and is in the upper end of Mohawk valley, near the Sierra county line, just below the Steelmao & Hayes, which last year took out \$45,000.

MILLER & COOK own a property in Mohawk valley which during the season closed, yielded \$3000, and that with very little expense.

WEST ELIZABETH.—This is a drift mine eight miles from Johnsville, on Poplar creek, and is owned by W. J. Miller. The lower tunnel is in 1382 feet and the upper 647, the two being connected. They cross the channel. The prospects of the mine are said to be fair.

THE SKOWHEGAN is a gravel mine owned by C. H. Clark and worked during the past seven years. It is paying well.

O. B. DOLLY owns a mine below old Jamison City. He worked it last spring and it paid well. **GARFIELD FLAT**, situated on Squirrel creek and owned by Peter Lorenzo, has been operated twelve years successfully. Nick Ross & Co. now work the mine. Quite a handsome sum of money has been extracted and its future looks bright.

SUNNYSIDE.—This is an incorporated mine on which work began in 1882. It was operated by the hydraulic process, but now drifting has been adopted. Many improvements are being made, sheds, dump-houses, etc., for winter work. Over \$75,000 has been taken out, including many very large nuggets. In 1890, the largest found weighed \$3267, others \$1188, \$618, \$520, \$500, \$250, \$300 and \$200 respectively, while numerous smaller nuggets were obtained, ranging from \$200 down. The principal owners of stock in this mine are the Jones Bros., D. McFarlane, Wm. Gibson, W. A. Sperry, Mercer Estate and Wm. Thomas.

CANYON PLACER is on Bear and Eureka creeks and owned by John M. Jackson, who is getting ready for operations next year. There is a large bank of gravel and a good water privilege. The prospects are claimed to be good.

GARBON & NEEY own part of the old Ohio claim, Nickrem & McKenzie being the owners of the other part. It was worked successfully last spring when a \$70 nugget was obtained. It is a large property.

LITTLE JAMISON.—Work continues on this noted property with regularity. Of the corporation, John Nevil is president and Sam W. Cheney, superintendent. M. A. Kerr is the efficient underground foreman. Numerous surface improvements have been made, such as a fine office and dwelling, stables, storehouse, boarding-house, etc., all indicating great confidence in the future of the property. A drain tunnel is now being run to tap a vertical shaft. This tunnel is now in 650 feet, with 1000 feet more

to run. The tunnel will intersect the shaft 165 feet from the surface.

PLUMAS EUREKA.—This old and reliable property continues its ample yield of bullion, yet the force of men employed in and about the mine is less than for several years past. The force of men is about 200. The mine is operated in a very economical manner.

San Diego.

AROUND JULIAN.—*Sentinel*, Sept. 3: There was joyful tidings from the Cincinnati Belle on the Saturday evening shift, a bunch of ore of wonderful richness being cut into. It has been stated that one man took out enough ore during the shift to pay all expenses that have been incurred since the reopening of the mine. With the Kerr mill working up small lots of ore there will be a decided stimulus for owners of claims to thoroughly open them up and have a test run made. We predict this will bring to light some rich finds. The veteran miner, Jerome Macdonald, is running a cut on the Bloomfield, with the prospect of cutting the ledge that made the Golden Chariot famous. It is rumored that the old dump of the Golden Chariot to the amount of 2000 tons is to be run through the Kerr mill at Banner. The new five-stamp mill for the Black Eagle mine on Mesa Grande is on the ground, in sections, awaiting the arrival of the superintendent to be put in place.

Shaasta.

A RICH DISCOVERY.—*Redding Free Press*, Sept. 5: J. T. Brown recently made a rich strike on the south fork of Deadwood, in Trinity, on the line of Shaasta county. In a shaft 40 feet from the grass roots Mr. Brown discovered a ledge four feet wide of ochre and gold. The gold comes out in chunks as large as hazel nuts, weighing from \$2 to \$4 each. It is simply a decomposed mass of wealth. The ledge was discovered about two years ago, and this rich strike is the result of assessment work. Mr. Brown thinks there are thousands of tons of ore and the ledge gets larger and richer as he goes down into the bosom of mother earth. The claim is on the top of the mountain and the locality has not been prospected much. There are several springs near by, and dirt taken from them yields good prospects. Geo. Klein, a pioneer miner of Deadwood, says that it is the richest discovery ever made in that section. Mr. Brown, so far, has a monopoly.

Sierra.

ROCKY PEAK.—*Mt. Messenger*, Aug. 29: Work has been begun anew on the Rocky Peak drift gravel claim, on the ridge between Eureka and Brandy City. A large amount of money has been spent on this ground in years past, but without developing a paying claim. The owners were not discouraged, however, but have gone down the ridge about a mile and a quarter, started again and have already found pipeclay, which is a very strong indication of a gravel channel.

CARNEY.—The mill on the Carney quartz ledge, at the head of Jim Crow canyon, was ready to run Wednesday morning, with the exception of some battery plates which were to be taken up that day.

THE GOLDEN GIANT M. Co. is running its main tunnel ahead to get under the channel, which was indicated by the last raise.

KEYSTONE.—*Mt. Messenger*, Sept. 5: Senator Mead has recently sunk down on a new chute of ore on the Keystone ledge. In 16 feet the pay chimney widened from six inches to 26 inches, and the rock yields \$15 a ton. This is one of the most extensive, valuable and promising quartz properties in Sierra county, and only needs a reasonable amount of capital to make it fully equal, if not surpass, the noted Sierra Buttes.

EXTENSION.—Cleanup at the Bald Mt. Ex. drift mine, for last week's work, was 105½ ounces, one nugget weighing 14 ounces. Total gold yield for the past four weeks—24 working days—425½ ounces, very good, considering the small force of drifters employed.

BEOROCK has been reached with the tunnel being extended from the bottom of Thistle Shaft up the ridge toward Gibsonville, but we have not learned of any gravel prospect.

Siskiyou.

CINNABAR.—*Siskiyou Telegram*, Sept. 5: Operations at the Cinnabar mine on Beaver Creek are progressing finely, and the new furnace is nearly completed. The reduction of ores will be commenced this week, and good results are expected. The ore veins have been pronounced as marvelous, both as to size and richness. There has lately been found several new veins in different parts of the mine averaging from two to ten feet in width, and all give the most favorable indications of both permanency and richness.

RIVER MINERS.—*Yreka Journal*, Aug. 29: The river miners all along the Klamath are getting down to bedrock in the channel and some of them are taking out rich pay gravel, with prospects of a big yield during the fall months until December.

CINNABAR.—We learn that the furnaces are nearly completed at the cinnabar mines on the west fork of Beaver, Siskiyou mountain, and that the reduction of ore will be commenced about Sept. 5th. The ore veins found are really marvelous in richness and extent, comprising three or four ledges in the mines from two to ten feet in width. The Beaver Creek cinnabar mines of this county, near the Oregon line, are destined to become the most extensive on the coast in producing quicksilver of the very best quality.

GRAVEL.—Lee, Lasb & Co. of the Greenhorn blue gravel mine started their pump again last week, which was sent to Portland for repairs, and commenced work on Monday in taking out pay gravel at the new shaft. The company expects to realize as rich and extensive body of blue gravel in a short time as at the old shaft and tunnel farther up the creek where the cave occurred. The shaft of the Yreka blue gravel mine is now down about 93 feet, with the blue gravel getting coarser, an indication of nearing bedrock.

Trinity.

THE RIDGEWAY.—*Trinity Journal*, Sept. 5: A letter from New River informs us that the Ridgeway mill started up last Thursday and that everything works well. The ledge runs from four feet to eight feet in width and four men can about keep the mill running 12 hours. The rock looks very well and the owners will no doubt make a good cleanup.

HALF GOLD.—The recent strike on Canon creek, known as the Maple is looking very well. They are

now sinking on the ledge, and we are informed that about 1½ inches of the rock on the footwall is nearly half gold. This is expected to develop into a good property.

GOOD ROCK.—The Enterprise Co. has again struck good rock in the old Enterprise ground. The rock is easy to work and rich. This company has a good property and it is paying well.

NEVADA.

Washoe District.

CON. CAL. & VA. MINE.—*Virginia Chronicle*, Sept. 5: Have continued to extract some ore from the openings on the 1300, 1500 and 1600 levels. 1650 level—Have continued to extract ore of fair quality from the drift run west from the top of the upraise carried up 59 feet above the southwest drift. Ore of fair quality has been extracted through the drift run east from the winze No. 3 (down 73 feet) in working upward from that point. 1750 level—In working out and upward from the bottom of winze No. 2 sunk from the 1650 level, we continue to extract ore of fair quality. There have been extracted from all parts of the mine during the week 1005 1310-2000 tons of ore, which were shipped to the Morgan mill. The average assay value of all of the ore worked at that mill during the week (980 tons) was \$20.02 per ton. Bullion shipped to Carson Mint, \$34,631.20.

OPHIR.—We have extracted and raised to the surface 58 tons of ore, the average assay value of which is about \$22.50 per ton. 1500—Have continued repairs on the incline leading from the shaft station on this level.

MEXICAN.—On the 1465 level, the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift, has been advanced 22 feet; total length, 242 feet; in a harder porphyry formation showing clay separations.

UNION CON.—From the east crosscut No. 2, on the 1465 level, at a point 1070 feet in from the main north lateral drift, a north drift, No. 2, was started and has been advanced 22 feet, in a soft porphyry formation.

CHOLLAR.—The east crosscut, 40 feet north of south line, 1100 level, is out 22 feet; face in quartz and porphyry, yielding assays from \$4 to \$10 a ton. The north lateral drift from the incline station, 1500 level, is out 29 feet; face in porphyry. The south lateral drift from the incline station, same level, is out 25 feet; face in porphyry.

POTOSTI.—The east crosscut, 100 feet south of north line, 1100 level, is out 104 feet; face in quartz and porphyry. The east crosscut, on the south line, 1300 level, is out 16 feet; the last four feet in quartz yielding low assays. The south lateral drift from the winze station, 1400 level, is out 19 feet; the face is in porphyry. The south drift, same level, is out 20 feet; the face is in porphyry.

ALPHA.—Are still re timbering the shaft.

EXCHEQUER.—There has been no work done on the 600 level during the week, owing to timbering the Alpha shaft. The joint south drift from the 1800 station of the Ward shaft is out 304 feet, the face is in porphyry.

BULLION.—The east crosscut on north line, 1300 level, is out 16 feet; the face is in porphyry and quartz yielding low assays. The joint south drift from the Potosi winze station, 1400 level station, is out 19 feet; the face is in porphyry.

SILVER HILL.—The southwest drift is out from the shaft 280 feet; the face is in quartz and porphyry. On the 160 level, the south crosscut is out from the winze 690 feet; face in hard porphyry.

UNION SHAFT.—The west drift from the shaft, 900 level, has a total distance west of shaft of 1039 feet; the face is in day and porphyry.

WARO COMBINATION SHAFT.—The joint south-west drift from the shaft, 1800 level, is out 304 feet; face in porphyry.

ANDES.—On the 420 level, north drift from east crosscut No. 3 was extended 16 feet in quartz formation. East crosscut No. 4 from the main north drift advanced 18 feet; face in quartz and porphyry.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine 295 tons of ore of the average value of \$18.30 a ton, as per battery samples. The winze from No. 2 crosscut, 100 feet south of the station on the 650 level, is down 19 feet in ore assaying \$15 a ton. During the month of August and part of July, the mill worked 2012 tons of ore of the average assay value of \$17.60 a ton, from which \$30,936 were produced in concentrates and bullion. The rock was worked to 87 per cent of its assay value.

GOULO & CURRY.—200 level: All work in top of upraise No. 2 has been stopped. Resumed work in main south drift at a point 125 feet from west crosscut No. 1 and extended same 30 feet through soft porphyry; total length 155 feet. East crosscut No. 2, 65 feet above 200 level, has been extended 18 feet through quartz and porphyry; total length 28 feet. Started a west crosscut, No. 2, opposite east crosscut, and advanced same 25 feet through soft porphyry.

Hawthorne District.

LAPANTA.—Walker Lake *Bulletin*, Sept. 2: The stopes above the No. 6 incline continue to show about the same. In the winze below the 100-foot shaft level, east crosscut has reached the footwall, and drifts are being run each way along same, the drift to the west showing a fine body of \$80-ore. The east drift is in low-grade quartz and iron. The formation is very large.

PAMLCIO.—No particular change to note. Everything running about the same.

IDA.—Extracting the usual amount of ore. **CAPITAL.**—Tunnel in 128 feet; ledge pitching eastward. There is some ore in the tunnel of very high grade. Expect to reach the main ledge early next week.

WAR EAGLE.—Still driving tunnel to tap the ledge. Tunnel is now in 160 feet. Will reach the ledge in a few days.

RIP VAN WINKLE (Marietta).—Taking up bottom and leveling tunnel to lay track. Twenty tons of silver lead ore shipped this week.

JENNY LINO (Marietta).—Vein in the stope above the north drift showing very well, and turning out considerable ore.

CENTRAL.—Stopping above the north drift, 130-foot level; producing the usual amount of ore.

MOUNTAIN KING.—Winze below the north drift in the main tunnel still being sunk, following the vein.

FAIRMOUNT.—Drifting north and south from the

bottom of the winze below the tunnel and stoping above the north drift; vein turning out very well.

HARTFORD.—Still sinking in the vein; ledge showing well.

Montgomery District.

A PROSPECTOR'S RETURN.—Calaveras Prospect, Sept. 5: W. T. Hull of Sheep Ranch, who went to the Mohave country to examine into the Montgomery discoveries in that region, returned this week. He reports that the Montgomery party have done fairly well, have one good mine, working rock with a small Kendall mill, but he does not highly recommend the country. He says it is too far from anywhere or anything. Water is hauled seven miles, freight costs five cents a pound from the R. R. and the one mine is the only one in which gold in paying quantities has been found.

ARIZONA.

WINTER PROSPECTS.—Tombstone Prospector, Sept. 3: There has been much talk of what is going to be done this winter in mining matters. Already there is renewed activity shown in Tombstone. More men are being put to work on the T. M. & M. Co.'s properties and also on the Comet. It is more than likely that several minor properties will start up this fall. It is announced also that the Grand Central mill will start up on October 1st on ore from the Seaverns mines. The ore has been tested and found to be profitable to work there. On what understanding the ore is to be worked we are not able to say. Si Bryant's property will be examined by Si White, who arrived yesterday. The ore from this mine is a milling proposition, and it is not at all unlikely that before two months have rolled by the Contention stamps will be dropping on Tom Scott ore.

IDAHO.

WORKING ORE AT FLINT.—De Lamar Nugget, Sept. 1: Some two years ago, Mr. M. F. Leech bought the Last Chance mine, one mile north of Flint, and since then has been devising a method to work the ores. Last fall he leased the mill from the Nebraska owners, at the same time securing an option on the entire Flint property for \$300,000, and began experimenting to save the value in the rock. He put in a battery of ten stamps and a number of small jig concentrators, and has experimented for several months. The results have been sufficiently satisfactory to warrant him to decide to take the property on his option, and to proceed to make permanent improvements on the mill. All of the old machinery except the power, has been taken out of the mill and discarded; the battery at first put up on the ground floor, has been removed to the floor where the rolls were formerly located, and the mill arranged for adding 40 more stamps, for which number there is ample room. The ore from the crusher runs into a bin from whence it drops into Hendy automatic feeders and is fed to the battery. It is discharged from the battery through 60-mesh screens, placed eight inches above the dies, on to the jig tables. The tailings from the jigs run over an incline table, covered with canvas, where a portion of the remaining value is saved, thence on a second table, and so on indefinitely, until the loss in the tailings is reduced to a minimum. At the present time only two tables are used, but two more will be added. The loss now in the tailings, working \$30-dollar ore, is about \$8, accruing chiefly from a percentage of rosin zinc which the ore carries. The present cost of milling the ore is something less than \$2 per ton; but with five times as many stamps at work and the machinery perfected, Mr. Seely, who has charge of the mill, estimates the cost can be reduced to about 80 cents per ton. Twenty-six tons of ore are now reduced to one ton of concentrates. It will be seen from the foregoing that very low-grade ore of this character, where it can be cheaply mined, can be made to pay. It is a revolution, or rather a resurrection for an extensive mining district which has been pronounced played out.

MONTANA.

CASTLE DEPOSITS.—Castle Tribune, Aug. 29: The ore bodies of this district are usually found on or near the surface, covered with an iron cap, which is non-mineral bearing. Immediately underlying this crust exists the ore. It is composed of carbonate of lead, containing a small amount of sulphates. It is also mixed with varying amounts of silica and oxide of iron. This ore maintains its carbonized character to an unusual depth. It is found in the Cumberland at a depth of 500 feet, which is the deepest workings. The character of the ore of this district will be found to change as it is more and more removed from atmospheric influences and approaches the water level. Here it may be expected to be encountered in its primary condition, that of a sulphide. The ore bodies of the Castle district are most usually found lying between a lime and porphyry formation. The veins run conformable to the strike. In these ledges the ore shoots occur at intervals. In the Cumberland, the mineral is found in lime, the same formation in which most of the great carbonate mines of Leadville existed. There are portions of the district in which the mineral is found in a contact lying between granite and porphyry, as on the Princess hill. On the Four Mile the leads are mostly true fissures in a granite formation.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City Enterprise, Sept. 4: The shipments of iron ore from Silver City for the past eight months ending August 30th were in round numbers 13,846,951 pounds, or a trifle in excess of 346 carloads of 20 tons each. The Arizona Copper Co. concentrates 20 tons of ore daily, and the smelter turns out nine tons of bullion. The San Francisco river forces a 3½-foot Leffel wheel to yield 120-horse power. T. W. Holson, who owns the True Blue at Lone Mountain, has extracted 140 sacks of ore which assayed 2743.07 ounces per ton. Supt. Foster, from Gold Hill, reports everything flourishing in that vicinity. The Reservation, the boss mine of the camp, is down 120 feet and drifting is in progress. Good ore in quantity is being extracted, and the management is highly pleased with the outlook. A small gold brick weighing 240 ounces was taken out as the result from 30 tons of ore. From January 1st to August 30th, a period of eight months, Wells, Fargo & Co. have shipped

from this city \$131,555 in gold and \$9876 in silver bullion. A considerable amount has been disposed of through the banks and other sources, roughly estimated at 33 per cent of the above amount, which added, gives a fair idea of what our mines have produced.

OREGON.

ASBESTUS.—Jacksonville Times, Sept. 3: Captain Bell and his assistants are at work in the asbestos fields in the Meadows district, and important news from that source may be looked for at any time now. The fields are extensive, and before they can be worked to any extent it will be necessary to open a road into the mines, and that will occupy the attention of all hands during the next few weeks.

QUARTZ.—E. Sanderson Smith, while on his trip to San Francisco and Portland, secured the co-operation of enough capital to ensure the thorough prospecting of the quartz mines at Steamboat and Gold Hill that he is interested in. There is no doubt but what this property is valuable, but it requires the outlay of a great amount of capital to develop it.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

- REPORT FOR WEEK ENDING SEPT. 1, 1891.
- 458,761.—TUG HOOK.—J. H. Boothe, Hollister, Cal.
- 458,762.—VARIABLE NOZZLE.—A. A. Charonnat, Nevada City, Cal.
- 458,680.—VENOING MACHINE.—Durie & Begg, Seattle, Wash.
- 458,681.—VENDING MACHINE.—Durie & Begg, Seattle, Wash.
- 458,565.—APPARATUS FOR RAISING SUNKEN VESSELS.—J. G. Enke, Los Angeles, Cal.
- 458,828.—PREPARING SKINS.—G. H. Farthing, San Jose, Cal.
- 458,574.—CABLE GRIP.—Hansell & Gill, S. F.
- 458,581.—DRILL PRESS.—A. E. Johnson, Carson, Nev.
- 458,852.—BLACKBOARD.—W. H. Larew, Mari-pa, Cal.
- 458,763.—LUMBER CLAMP.—W. A. Madden, Madera, Cal.
- 458,765.—ELEVATOR SAFETY DEVICE.—Moen-ning & Haeseler, S. F.
- 458,766.—WINDMILL.—M. S. Pires, Centerville, Cal.
- 458,758.—PILLOW SHAM HOLOER.—Rutherford & Roberson, Napa, Cal.
- 458,759.—CAR TRUCK.—W. H. Siebecker, S. F.
- 458,698.—FEE-O-WATER HEATER.—B. W. Taylor, Los Angeles, Cal.
- 458,671.—CAR AXLE.—H. P. Willard, Tustin, Cal.
- 458,930.—TABLE.—F. E. Wood, San Jacinto, Cal.

The following brief list by telegraph, for Sept. 8, will appear more complete on receipt of mail advices:

California.—Ulrich Bachman, San Francisco, bottling apparatus; Michael Barthel, San Jose, an extensor; George Biddell, Woodland, self-heating mechanism; Frank A. Brooks, San Francisco, arm rests; John Driver, San Leandro, vehicle; Milton Hall, San Francisco, wall protector and fender; James K. Kendrick, Germantown, plane; William B. O'Connor, Stockton, odorless gas stove; Lewis I. Thompson, Mukluine Hill, obstetrical device; Washington—William H. Garlock, Seattle, car coupling; Asia Mosier, Buckley, foot support for wood choppers.

Nova.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VARIABLE NOZZLE.—A. A. Charonnat, Nevada City, Nevada Co. No. 458,762. Dated Sept. 1, 1891. The object of this invention is to provide a simple and effective nozzle, the discharge of which can be varied and regulated by means of a regulating plate so constructed and arranged as to be perfectly balanced to permit the ready and easy operation. The invention consists of a nozzle having fitted to its end a transverse hollow seat, in which is adapted to be reciprocated a plate formed with a succession of apertures of varying diameters, said plate having a stem on each end passing through stuffing boxes whereby it is moved to bring any of its apertures into alignment with the nozzle, or to bring a solid portion opposite thereto to serve as a gate. When it is desired to change the capacity of the nozzle to a greater or less degree, the regulating plate is moved to one side or the other in order to bring the proper aperture into alignment with the nozzle passage. The regulating plate being balanced, little power is needed to move it one way or the other.

PILLOW-SHAM HOLOER.—Wm. T. Rutherford and A. J. Roberson, Napa, assignors of one-third to D. H. Switzer. No. 458,758. Dated Sept. 1, 1891. The invention consists in the novel construction and arrangement of the hook-bar which supports the pillow-sham, and the means for operating and controlling said bar to raise the sham and to hold it down.

LUMBER CLAMP.—Wm. A. Madden, Madera, Fresno Co. No. 458,763. Dated Sept. 1, 1891. The object of this clamp is to bind together bunches of lumber to be sent in compact masses down a flume. The clamp can be readily adjusted and tightened to place on the end of the bunch, and will avoid any necessity of using wedges commonly employed to spread the lumber to tighten the bunch in the clamp. A further object is to provide a connection between the adjacent bunches of such a character as to permit each bunch to turn freely to its riding side without cramping or danger of loosening the clamps, and which will hold each bunch

in place and not permit any riding over and consequent jamming in the rapid of the flume. The hooks, being swiveled, permit each bunch to turn freely to its riding side, and the connection between them is too short to permit any bunch to ride over the end of another.

SAFETY DEVICE FOR ELEVATORS.—E. F. Moening and K. A. W. Haeseler, S. F. No. 458,765. Dated Sept. 1, 1891. This novel safety attachment for elevator cages consists in the combination, with the cage and the vertical guides of supplemental vertical bars fitting in grooves in the outer faces of the guide timbers, said vertical bars being connected at top and bottom with angularly-disposed levers, by the action of which they are drawn toward the center or forced outward. It further consists in connection with these levers of the suspending link, springs acting upon the levers when the link is released by breakage and cushion springs upon which the elevator cage is received when the safety attachment is thrown into action.

TUG HOOK.—John H. Boothe, Hollister, San Benito Co. No. 458,761. Dated Sept. 1, 1891. The invention relates to the general class of tug hooks and especially to those which are adapted for what is known as "short-tug harness," or "butt-chain" harness. The object of the invention is to provide a hook which can readily and effectively engage the chain connection with the whiffletree, but which has its point so guarded and protected that it cannot by any accident cut or injure the horses. The construction is such that the tongue of the hook is not apt to be opened by any accidental cause.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 10, 1891. Business the past week was largely interrupted by two holidays. The feeling in all branches of trade continues to prevail that we are entering an exceedingly prosperous season. Taking manufacturers as a whole, and more is doing with them than for all of three years past. This not only covers this city, but extends to other trade centers and manufacturing points on this coast. The money market is generally easy, notwithstanding the efforts of a few moneyed speculators to tighten it so as to buy speculative articles or securities at low prices to sell out at higher prices when their artificial closeness disappears.

QUICKSILVER.—Receipts the past week aggregated 264 flasks. The market is stronger at a slight advance. Sales are reported at a slight advance on our quotations.

MEXICAN DOLLARS.—The market is fairly steady around 77½ cts. The shipments to China continue quite free.

SILVER.—The market both at home and abroad is strong at a slight advance. Private telegrams received to-day from New York quote that market at 98½ cts. In this city the Mint is paying 98½ cts., but even at this figure many holders are not disposed to sell. Our advices from the Comstock mines are very decided in this statement that all encouraging work is being done toward the West, where it is known a gold-bearing lode exists. While the news does not warrant the belief that a bonanza will be found, yet it is rich in gold, but generally narrow. This work is accepted as proof positive that the managers of the above mines have seemingly given up the futile hunt after large silver bonanzas. With the Comstock mines gold producers instead of silver, the latter's market value ought to improve outside of all other considerations. The shipment of silver bullion from England to India ought to be made soon more freely.

BORAX.—The market is essentially unchanged, with a fairly firm tone reported.

LIME.—Receipts the past week aggregated 1404 bbls. The demand is only fair. The Hawaiian islands do not appear to be drawing their usual quota.

ANTIMONY.—The market continues to rule in buyers' favor, in sympathy with lower prices at the East.

IRON.—Imports the past week aggregated 100 tons from New York. While the market is not reported stronger, yet there appears to be a better tone. Stocks are being lowered, but while this is the case with spot supplies, still there are free consignments on the way. At the East there is a growing belief that the railroads will soon be in the market for rails, which, if proven correct, ought to bring about better prices for pig.

LEAD.—There is nothing new to offer. Prices for both pig and the manufactured products are unchanged.

COPPER.—At the East and also abroad there appears to be more pronounced symptoms of still better prices later on, but of course this depends quite largely on the output of American mines.

COKE.—Imports the past week aggregated 500 tons from Swansea. The market is fairly steady under a free consumption.

COAL.—Imports the past week aggregated as follows: 1500 tons, Departure Bay; 4300, Comox; 3757, Liverpool; 2456, Swansea; 2411, Seattle; 300, New York; 2620, Newcastle, N. S. W.; 4540, Sydney; 1100, Port Townsend; 756, Nanaimo; 23,734 tons. The market is reported still easier, notwithstanding the very large consumption. Increasing shipments on the way combined with heavier outputs of the coast mines are against sellers. The following is the tonnage on the way from Australian ports: To San Francisco from Newcastle, N. S. W., 64,314 tons register; from Sydney, 13,797 tons; total, 80,111 tons. To San Diego from Newcastle, N. S. W., 16,076 tons register. Grand total, 96,187 tons register, equivalent to about 150,000 tons carrying capacity.

Mining Share Market.

A partial holiday on Monday and a legal holiday yesterday (Wednesday) interfered, to some extent, with the mining share market. On Friday the Comstocks, under the leadership of Savage, developed considerable strength, which was maintained up to and including Monday. On Tuesday shares closed lower, chiefly under cross-order sales. It is needless to say that the improvement in prices on Sat-

urday brought out increased numbers of "minnows," and with their appearance, so as not to lose stock, the pool began to sell off bear stocks. Prices now quoted for stock are altogether too low for the pool to peddle them out, when it is considered that the mines are in better condition than ever before and all interests working in harmony. While the writer believes in very much better prices before many months pass, yet it is best to state that the market is apt to see several breaks of from 40 to 60 per cent, probably on assessments or some other scare, with innumerable 10 to 20 per cent setbacks. People quick enough to get these turns will make considerable money, but there are those who buy, pay for the stock, and do not attempt turns, well knowing that very few, if any, can come out winner in the end. In considering the future of the share market, it is well to keep in mind the simple fact that it has been three or more years since this country has had a speculative craze, and consequently the people are ripe for some such excitement. The first move this year in a speculative way was that in wheat, based on the world's statistical position; following on its heels is a speculation in railroad securities, and it is safe to say that the mining share pool will not be slow in fostering a speculation in their holdings.

The difficulty heretofore appears to have been, that outside holders on every substantial advance in prices came in as sellers instead of buyers, and to maintain a deal under such a condition, it would require unlimited capital. With a speculation craze in other securities, it takes very little to promote a big boom in mining shares, and that, too, without showing up much ore. The savings banks in this city give unmistakable evidence that money is in oversupply, and when this is the case, persons having these holdings can be easily brought into the arena as speculators, by allowing some of the more talkative "gudgeons" to make money by trading in shares.

The position taken by the MINING AND SCIENTIFIC PRESS, that there was a distinct and separate west lode, is being accepted by the local press at Virginia. In substantiation of this, we give the following from Tuesday's Enterprise: "Sierra Nevada people have demonstrated beyond all doubt that the syenite footwall of the Comstock is not the limit of ore on the west. After passing through a syenite casing 700 feet thick on the west, the crosscut went through 18 feet of clay and quartz, and then entered as likely a vein formation of quartz and porphyry, which it penetrated for 70 feet, as can be found anywhere. The rock that the crosscut is now penetrating yields assays in gold and silver, and there can be no question but that it is a separate and distinct ledge formation, the value of which time, money and muscle will reveal."

It is reported that a leading Comstock magnate gave a lady friend a tip on Potosi and Bullion when the prices were considerably higher than now, promising to sustain all losses, if there were any. This reminds the writer that a leading citizen of Oakland, who is said to be a particular friend of certain mining magnates, was first put into the Tuscarora stocks, on the same condition. The shares at the time were selling at dollars. All friends of this gentleman who bought on the "tip" were heavy losers, for the price of the shares went down to cents with assessments added.

We are informed that arrangements are being made for the delivery of one or more lectures under the auspices of the Mining Stock Association, for the purpose of showing up the peculiar methods in vogue in mining ore on the Comstock. The lecture will be embellished by stereoscopic illustrations from scenes taken on the spot.

Con. Virginia passed its dividend to-day. In the suit of M. W. Fox vs. Savage Mining Co., Judge Sanderson's decision is accepted as favorable to Mr. Fox. Now as he claims 19½ feet of the 600 feet of the Savage mine, he can come in as a cotenant, and either jointly or separately work his portion. More interesting developments can be looked for later on.

Mining shares opened dull and heavy this morning, which causes outside operators to look on in wonderment as to what will be the next move.

The news from the Comstock mines continues very encouraging, for although the pool is getting, so to speak, deaf, dumb and blind yet some news does leak out. The work in Con. Virginia is closely watched, as is that going on in all the North End mines. In the former, as the north drifts are being run on the 1100 and 1800 feet level, there ought to be more active times in that stock. In Best and Belcher, Gould and Curry, and also in Savage, the work gains in importance as it progresses, the only trouble is that the work in the mines may be stopped just when it should not. In the Gold Hill mines, private advices report encouraging news. If the mines were differently managed, so as to inspire confidence in the public, the present showing would cause considerably higher prices to obtain.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

ARIZONA MINES.		Dr.	Cr.
Crocker.....	Dr. Or. Gould & Curry.....	\$16,580	
Locomotor.....	\$1,521 Hale & Norcross.....	839,896	279
Peeries.....	3,153 Justice.....	4,9	8
Silver King.....	1,682 Kentucky.....	7,137	
Wells.....	402 Lady Washington.....	13,481	310
BOIE MINES.			
Bodie.....	Merced.....	16,835	
Bulwer.....	6,406 Ophir.....	20,126	
Monie.....	6,873 Overman.....	26,659	
Standard.....	2,624 Potosi.....	7,656	
Syndicate.....	25,638 Savage.....	7,370	
COMSTOCK MINES.			
Alpha.....	7,522 Seg. Belcher.....	785	
Atlas.....	Geo. pion.....	4,037	
Belcher.....	11,899 Sierra Nevada.....	13,011	
Bullion.....	2,348 Silver Hill.....	11,740	
Caledonia.....	18,059 Utah.....	3,889	
Challenge.....	23,078 TUSCARORA MINES.		
Chollar.....	76,941 Belle Isle.....	3,315	
Confidence.....	19,747 Comstock.....	12,221	
Con. Cal. & Va.....	22,301 D. Monte.....	9,603	
Con. Imperial.....	13,254 Diana.....	264	
Con. New York.....	7,339 777 Grand Prize.....	2,395	
Crown Point.....	24,852 Independence.....	1,115	
Exchequer.....	9,626 Nevada.....	13,409	
East Sierra Nev.....	146,172 Nevada Queen.....	13,808	
	13,517 73 North Belle Isle.....	33,216	
	5,332 N. Comstock.....	4,401	
	11,638 MISCELLANEOUS MINES		
	22,404 Eureka.....	43,943	
	1,337 Holmes.....	40,794	

Crown Point has \$1490 due on assessment. Holmes has unpaid bullion amounting to \$7000 ounces. Occidental has unpaid bullion amounting to \$10,419.97. Con. Cal. & Va. has unpaid bullion amounting to \$88,551.50 and further shipments to arrive. Navajo has \$12,800 due on pumping account.

MECHANICAL PROGRESS.

Insolubility of Pure Metals in Acids.

The results of an investigation concerning the cause of the insolubility of pure metals in acids are contributed by Dr. Weeren to the current number of the *Berichte. De la Rive*, so long ago as the year 1830, pointed out that chemically pure zinc is almost perfectly insoluble in dilute sulphuric acid. Dr. Weeren's theory of the phenomenon is as follows: "Chemically pure zinc, and also many other metals in a state of purity, are insoluble or only very slightly soluble in acids, because, at the moment of their introduction into the acid, they become surrounded by an atmosphere of condensed hydrogen, which, under normal circumstances effectually protects the metal from further attack on the part of the acid." The experiments from which this theory has been derived were briefly as follows: The amount of chemically pure zinc dissolved by the acid was first determined. It was next sought to determine what difference would be effected by performing the experiment *in vacuo*, when of course the escape of the hydrogen would be greatly facilitated. The solubility was found under these circumstances to be increased sevenfold. Next, the experiment was performed at the boiling temperature of the dilute acid, first when ebullition was prevented by increasing the pressure, and secondly when ebullition was unhindered. In the first case, when ebullition was prevented, the solubility was practically the same as in the cold; while in the second case, with uninterrupted ebullition, the solubility was increased 24 times. Finally, experiments were made to ascertain the effect of introducing into the acid a small quantity of an oxidizing agent capable of converting the hydrogen film to water. When a little chromic acid was thus introduced the solubility was increased 175 times, and when hydrogen peroxide was employed the solubility was increased three hundredfold. The explanation of the ease with which the metal becomes attacked when the ordinary impurities are present, is that the hydrogen is not then liberated upon the surface of the zinc, but rather upon the more electro-negative impurities, leaving the pure zinc itself open to the continued attack of the acid.

The Sand Blast.

It is a strange matter that notwithstanding our boasted progress, the sand blast has made but little progress in this country. The Tilghman Sand Blast Company at Sheffield, England, uses at least 200 horse power of steam in its operations, and the application elsewhere in Europe is extensive, but in the United States, for some reason, people have not availed themselves of it as they might have done for various purposes. The main operation carried on at Sheffield is that of recutting files—not recutting old files, although some of that is done, too, but recutting new files, to improve them; and here comes in another important discovery in this process.

The Sand Blast for Sharpening Files.

At some place in New England where a sand-blast machine was employed, an attempt was made to clean a dirty file by holding it in the jet. The file was of course cleaned at once, but the effect was something more. The file, although a worn one, had all the characteristics of a new one, which, as all mechanics know, is a very noticeable change. Other files were treated in the same manner, with a similar result, and the discoverer proceeded to patent the process in this country, assigning the invention to Messrs. Tilghman for European countries.

Then began another round of experiments to determine the precise nature of the effect produced. The experiments extended to giving a certain number of uniform strokes with files and weighing the metal cut away. New files and old ones were treated, until the precise nature of the effect was learned.

Every one knows how files are cut with chisels that raise up shavings or teeth. These are of curved form and with a thin edge that soon crumbles or breaks, unless the cutting is skillfully done and the steel of good quality. When treated by the sand blast, the files are held at an angle, so the sand impinges on the back of the teeth, cutting away the thin edge, but not affecting the face, so the teeth become strong cutters, without the thin curled edge left by the chisels in cutting. The operation is very rapid, requiring but a few seconds, and the value of the files is much increased, so much so that a great many of the files made in Sheffield and on the Continent are treated in this manner. Sand, in the common sense, is not used in this process, but a mixture of sandy clay and water, thin enough to be circulated by pumps. This mixture of clay-water, it may be called, is drawn in by induction nozzles and discharged through a thin slit made in chilled cast-iron tips that wear away very rapidly.—*Engineering and Mining Journal.*

RIVETED JOINTS.—What value shall we give to the iron rivet when used in connection with steel or iron plates? To determine this question Mr. Allen, of the Hartford Steam Boiler Inspection and Insurance Co., made use of the Emery testing machine at the U. S. Arsenal at Watertown. The experiments were made with American iron and steel, and hence will be

valuable in practical work in this country. In a series of five experiments with steel plates and iron rivets, holes punched, the shearing resistance per square inch was as follows: 39,740 pounds, 38,190 pounds, 39,770 pounds, 35,638 pounds and 41,100 pounds. In view of these results, the lecturer assumes that 38,000 pounds per square inch is a safe estimate of the single shearing resistance of iron rivets in steel plates. Assuming 38,000 pounds as the safe estimate, we must decide upon the thickness of plate, diameter of rivet hole, and pitch of rivets. In deciding upon these elements in the problem, we must so adjust the size and pitch of rivets as to make the shearing resistance of the rivets as near the strength of net section of plate as possible. By a series of computations too lengthy to be here given, Mr. Allen shows the efficiency of a single riveted joint to be 56.6 per cent and 63.3 per cent to be the efficiency of a double riveted joint, while the efficiency of a triple riveted joint is 75 per cent.

A RAPID ANNEALING FURNACE.—An annealing furnace having a very rapid action is announced as the outcome of the experience of Mr. G. Tomkinson, who for many years has been engaged in the designing and construction of such furnaces. It is applicable to sheet annealing, hollowware, malleable iron, sheet tin, or steel. In the case of sheet annealing the time is said to be reduced by 50 per cent, with other advantages. The furnace consists of four outer walls, within which, by the erection of two side walls and one end wall, is a second furnace or annealing oven. The flames and heated gases from the outer space pass through numerous perforations in the two side walls into the middle chamber, and after traveling through this space escape by bottom flues furnished with dampers to the chimney stack. Only one fire is used, and the pot containing the articles to be annealed is by this arrangement subjected to a uniformly distributed heat. Hence the pot does not suffer from undue strains or buckling, and lasts longer than usual. The uniform distribution of the heat also accounts for the shorter time occupied by the annealing, and likewise causes a reduced fuel consumption. We understand that several of these furnaces are in successful use in the Midlands.—*London Iron.*

FOUNDRY ACCIDENTS.—Too much care cannot be exercised in placing old iron in a furnace or in manipulating the molten metal while pouring. Quite a serious accident recently occurred in an Eastern foundry which a little care and forethought might have avoided. A solid piston head went into the cupola with other iron to be melted, and there was probably some water in it that created steam and exploded. The cupola was blown out, and one man injured a little, but not so as to prevent his keeping at work. The damage was not important. About the same time an accident of a similar nature occurred in another foundry near by. A cylinder head being melted, exploded on account of water contained in it, killing one man's face with clinders and blowing a hole through the shop roof. Ordinarily, a cylinder head does not go to the scrap heap until broken, and in any case is not supposed to be filled with water when screwed up. But sometimes water finds its way in through pores in the iron, so machinists say. Still another accident was noticed when a piston head, being repaired in a machine-shop, exploded. Too much care cannot be observed in handling hollow castings in either the foundry or machine-shop. Nothing of the kind should be allowed to go into a furnace or forge without being either broken or carefully examined.

MAGNOLIA METAL IN ROLL BEARINGS.—At the Blochain Works (near Glasgow) of the Steel Company of Scotland, Magnolia metal has recently been tried to obviate the trouble caused by heating of roll necks, and the rapid wear of the journals caused thereby, and it is stated, with entire success. In a trial by the Stockton (on Tees) Malleable Iron and Steel Co., on their 31-inch steel plate mill with phosphor-bronze bearings at one end of the rolls and Magnolia metal at the other, the former was worn out after 14 weeks, while the latter was scarcely worn at all. In this use of the metal, the Stockton Company says: "The bearing is cast first, and is of a special phosphor-bronze for bottom chilled plate roll necks and other bottom roll necks. After the bearing is cleaned and dressed in the ordinary way, a segment of loam core of proper radius is placed against the bearing, and the magnolia is then run into the recess provided for it. This is the very best kind of bearing for the heaviest possible work. Many other methods are suggested, but this is the cheapest and best. If the bearings were not of the best phosphor-bronze, the end thrust of the rolls would wear the collar away and cause the bearing to be changed when the magnolia face of the bearing was quite good and not at all worn away."

A NEW USE FOR RAMIE.—Steam pipes have recently been made of ramie fiber, hardened under tremendous hydraulic pressure, and possessing a tensile strength equal to 23 times that of steel. The ramie fiber, or China grass, has the property of being unaffected by moisture; it will not shrink nor swell, it is a non-conductor of heat, it cannot rust, and these features, together with its great strength, are all desirable in steam pipes, its utilization in this line being regarded, therefore, as one of the possibilities of the future.

A NEW WRINKLE IN WELDING.—A new welding method; invented by H. E. Fowler, New Haven, Conn., refers principally to lap-welds for joining the ends of band-saws, plates and bars, and the manufacture of water-pipes, boiler shells and the like. The process consists in first forming holes in one of the parts to be united so that, when the parts are heated and welded by any convenient means, a portion of the metal of the other part will be forced into said holes, strengthening the joint. In modifications, holes are formed in both the parts to be welded, and in some cases, these holes are made to coincide, and pins or rivets are inserted.

WORKING IN GROOVES.—There appears a decided tendency among mechanical men to work in grooves. When a certain end is sought in a piece of machinery half a dozen men will select perhaps as many different ways of attaining the end sought. One man plans his faith to toothed wheels, and will use them as spurs or helves to get almost any motion; another man works with pawls and ratchets, and a third with cranks. All this often arises from some particular bent of mind impressed, perhaps, by a special early training.

BUILDING A LOCOMOTIVE IN TWELVE HOURS. It is stated that the machinists in the shops of the Pennsylvania Railroad Company at Altoona are about to begin the difficult task of producing an improved locomotive of the mogul type in 12 hours, which, if done, will heat the highest record known by about three hours.

NEW STYLE OF DRIVING BELT.—A driving belt composed of a flexible woven or fibrous material, with an exterior of rubber, is the invention of a New Yorker. The coating is smooth and plain on the outer side, but on the inner or gripping surface it is formed into transverse parallel flutings.

SCIENTIFIC PROGRESS.

Motion by Electric Current.

A fine metal wire stretched between two supports, one of which is provided with a strainer or spring for regulating the tension, on being traversed by a continuous current, begins to vibrate.

The amplitude of the vibrations, which is at first very small, increases as the time goes on, and quickly arrives at a maximum, which it maintains as long as the current is passing through, provided that the surrounding atmosphere remains in the same condition, or, at any rate, does not undergo any sudden change. The vibrations may thus continue indefinitely; they stop in a few seconds when the current is interrupted.

For a given tension, the amplitude of the vibrations seems to depend (according to the experiments which I have made up to the present) on the difference in the temperature of the wire and of the surrounding atmosphere. Now as it is the intensity of the current which produces this difference of temperature in a given wire, the amplitudes should vary according to the intensity.

The explanation of this fact seems to me to lie in the interchange of heat between the wire and the surrounding atmosphere; this constitutes really a *thermic motor*, in which the energy expended is supplied by the current, and the principle of the conservation of energy can be applied to it.

Any cause producing a change, in any manner whatever, in the mode in which this interchange of heat takes place will modify the phenomenon in some way or other. We can foresee that the finer the wire, the more rapid will the vibrations be; this is confirmed by experiment. I repeated the experiment with wires of different natures, and found that the phenomenon always preserves the same character. If we put the wire in a large glass tube, the movement is regular, because the wire is sheltered from the movements of the air. Occluding the two ends of the tube, I observed no change in the rapidity of the vibrations.—*Cor. Scientific American.*

SCIENTIFIC AND PRACTICAL KNOWLEDGE.—All knowledge is comprised in two classes. The first is that effect of mind which is the result of curiosity, that species of human instinct which prompts us to inquire the reason for everything we see, every action which takes place among others, among all living beings, among the elements, and among the celestial bodies. Mankind being endowed with reason, the next impulse is to apply the knowledge so gained to some useful purpose, to produce some benefit to ourselves. The first of these two classes is called "scientific investigation," the second is called "applied science." For instance, we notice for the first time a light from which smoke arises; we investigate, we perceive heat, and that it produces a disagreeable sensation. These are the first scientific facts; we apply the knowledge so gained by resolving never to touch fire. This is applied science. We have employed curiosity to find out the facts. We now employ caution to guard ourselves against damage, and we determine never to touch fire. All knowledge so gained is by this process; we may be told a thousand times that fire will burn, but we feel that that is only a theory; we want facts, and we obtain them by a course of scientific investigation. We use these facts and thus gain experience, knowl-

edge, at first scientific, next practical; and these two conditions make up the sum of all knowledge. Science is the foundation, practice the superstructure.—*H. Z.*

VOLATILIZATION OF IRON.—Quite recently Messrs. Mond & Quincke discovered that nickel combines with carbon monoxide to form a nickel-carbon oxide, which promises to be useful in connection with the development of nickel plating, says the *Scientific American*. At that time the experimentalists failed to obtain any similar compound of carbon monoxide with another metal. Considering it strange that nickel should be the only metal capable of entering into combination with this particular gas, they persisted in their investigation, more especially with iron, under very varied conditions, and they have at last succeeded in demonstrating the fact that iron is volatilizable, although apparently in very small quantities, in a current of carbonic oxide. This result was communicated to the Chemical Society, and the particulars of Messrs. Mond & Quincke's experiments are reported in the journal of the society. Suffice it to note here that they volatilized some finely divided iron in a current of carbonic oxide at ordinary temperatures; the deposits from this process giving all the known reactions of iron in remarkably brilliant colors. The practical importance of this discovery may or may not be considerable, as further research will be needed to establish the conditions under which the action can take place.

AIR AS FUEL.—An explanation of the process is as follows: Air is mixed with coal gas, as every one knows, and with hydrocarbon vapors, and the compound when burned generates a much greater heat than if the air were absent. So, too, a powerful air blast is a great economizer in smelting and reducing ores. But the new fuel is the air itself, which as a powerful blast is directed upon an incandescent substance, say coal made white hot, pure carbon or any other materials that can be made to glow. Coal, hydrocarbons or what may be employed to give the initial incandescence, but once the blast strikes the luminous body, the utmost intensity of heat is secured apparently by the combustion of the air, and may be maintained for an indefinite period by merely pressing the incandescence of the surface, and this may be done by a slight manipulation of the surface brought to incandescence, and with some slight renewal of carbonaceous material.

METALLIC IRON IN PLACE.—Mr. Daubree, a French scientist, received recently some curious specimens of metallic iron, found at a depth of several yards in the auriferous deposits at Priskavny, near Berezowsk, in the Urals. Analysis points to the presence in the metal of a very slight quantity of platinum, with no trace of nickel. The iron is, therefore, of terrestrial origin, and cannot be attributed to a meteoric fall. On the other hand, it shows an extremely remarkable leaved and figured structure, which can only be interpreted by supposing that, during its passage toward the surface of the earth, it has been subjected to intense mechanical actions, comparable, for instance, to those which develop the explosive gases generated by the ignition of gun cotton or dynamite.—*Iron.*

GLASS CUTTING.—Experiments have shown that instead of cutting out glass file fashion, a diamond works in another way. The parting of the glass is due to the forcing of the particles apart, as the orack when once begun may easily be made through the glass by a very light force. According to measurements which have been made, the superficial cut or orack need be but 1-200 part of an inch deep. Quartz and other articles of a like nature will cut glass as readily as a diamond, but being softer are not of so much value, as they do not retain the sharp edge necessary for the successful operation.

The first electric road designated to carry United States mails, has just been put in operation between the near by cities of St. Paul and Minneapolis. The cars are running regularly. The mail cars are designated from the other cars on the road by flying a U. S. flag and carrying mail boxes, properly fixed, for receiving letters at every stopping. The initiation and the success of the system is made a matter of much congratulation by the denizens of the twin cities.

THE MAGIC LANTERN AT SEA.—There are hopes of introducing the magic lantern as a means of signaling at sea. When so used the lantern will be called the "Ludograph." It will have slides in the shape of stenoid plates, each with a letter or figure cut in it. The screen is a flag stretched in a conspicuous part of the ship, on which the letter of the slide is projected. By the help of glasses the distant ship reads the letters.

SNOW WATER.—It was long thought that the water from melted snow was the purest of all. This idea has been proven incorrect, as the reverse is the case. Snow is really a purifier of the atmosphere, attracting from it, as it falls, various impurities, and these are found in the snow-water.

SOME EXPERIMENTS relative to the utilization of carbonic acid gas produced in the fermentation of sugar which have been made at the St. James Gate (Guinness) Brewery at Dublin are giving much satisfaction.

ELECTRICITY.

Electrical Car Propulsion.

There is a growing idea among the people at large, that the electric motor is soon to supplant the steam locomotive as a traction agent on ordinary railways. Nearly all electrical engineers feel quite sure of such a result; but steam men and mechanical engineers, outside of electrical circles, while they admit the possibility of such a result, are quite decided in their opinion to the contrary.

Experience thus far, however, shows quite conclusively, that electric traction is an economic success on street railways and suburban service, where traffic is concentrated and cars must be run frequently and on short routes. But it is held by doubters, that when rapid transit, heavy trains and particularly heavy traffic is required, electricity is, and ever will be entirely out of the question. Still it is acknowledged by all, in view of the wonderful progress already made in this direction, that it would be foolish to say that electricity may not, at some early day in the future, be able to supersede steam on every class of railway traffic.

Relative Cost of Electricity and Horses on Street Railways.

The West End Railway, which operates 260 miles of street railway in and near Boston, 60 by electric motors and 200 by horses, made the following report for June last:—The cost of operating the electric cars averaged 20.37 per cent per mile. The operating expenses of the horse cars during the same time averaged 24.58 cents per car mile. A still greater difference was shown in the earnings, which averaged 42.71 cents per mile for electric cars, and 36.85 cents per mile for the horse cars. This left net earnings per car mile of 22.34 cents for the electric cars, and 12.27 cents for the horse cars. The total mileage of electric cars during the month was 360,568 miles; and the total horse car mileage was 1,073,217 miles.

For the three months ending June 30, the percentage of operating expenses to gross earnings was 56.23 per cent for the horse cars, and 72.7 per cent for the electric cars.

These expenses do not, of course, include the interest on the cost of the two sections of the road and their respective plants of electricity or horse power; but it does include the cost of keeping up the electric power, and of feeding and caring for the horses. The first cost of the electric power exceeds that of horses; but the wear and tear of the former is undoubtedly less than that of the latter, and the net profit in the long run must be greatly in favor of electricity.

A Comparison with Steam Traffic.

The Engineering News of New York institutes a comparison between the earnings of the Boston West End Road and 15 of the leading passenger railroads of the country; also between that road and the general average of all the railroads in the Union, which we reproduce as follows:

PER CAR MILE OR PASSENGER TRAIN MILE.	Ave. earnings.	Ave. operating expenses.
West End Ry., June, '91:		
Electric Cars.....	\$0.4271	\$0.2037
Horse Cars.....	0.3685	0.2458
All Rys. of U. S., year ending June 30, '89.....	1.0628	0.5743
Boston, Winthrop & Shore.....	0.5411	0.1876
Cairo, Vincennes & Chicago.....	0.6255	0.2053
Cent. R. R. and Bank Co. of Cal.....	0.8812	0.3765
Cleveland & Canton.....	0.5147	0.2500
Dayton, Fort Wayne & Chic.....	0.3811	0.2721
Del. & Hud. Canal Co.....	1.6353	0.4253
Del., Lack. & W.....	0.9775	0.3009
Current River.....	0.9743	0.1803
Kan. Cy. & Pacific.....	0.2224	0.0732
Ohio River R. R.....	0.5568	0.2130
Pennsylvania R. R.....	1.3051	0.6414
Pennsylvania Co.....	1.0128	0.4177
Pittsburgh, Marion & Chicago.....	0.4574	0.0958
Talladega & Coosa Valley.....	0.3245	0.1569
Zanesville & Ohio River.....	0.5504	0.1560

Even when we take into full account the greater cost of equipping an electric road as compared with one operated by steam motors, the showing is not bad; and especially is it not when we further consider the immature and receding condition of electrical science as compared with that of steam. If we go back and review the progress made in the advance of direct steam as connected with railroading during the same length of time that it has been required to place electric propulsion in its present condition, we have abundant reason to hope for an early supplanting of steam by electricity. Electricity is as yet but in its very infancy, while steam is in the full age of its maturity. We can hope for no material advance in the economy of steam traction, while almost every day witnesses important progress in the science of electricity in all its varied applications to industry.

Even as we write, we hear of a most important advance in the mode of transmitting the electric current, and one which bids fair to work quite a revolution in transmitting electric power over long distances. The experiments are being made in France.

THE FIRST ELECTRIC TRACTION PATENT—As an interesting contribution to the history of electric power transmission and electric traction, the *Moniteur Industriel* cites the fact that on Jan. 16, 1855, Henry Gilhe was granted a patent "for the employment of two magneto-electric machines united by wires, one of the machines being put in motion by any convenient power, and generating a current which causes rotation of the second machine." The

inventor, it would appear, foresaw also the establishment of a number of motors along the line of a conducting wire, taking power from it. The inventor was M. Bessolo, a business arrangement having been entered into by him with Mr. Gilhe for the purpose of commercially developing the patent. Possible applications of the latter were, at the time, pointed out to be the operation of machine tools, and electric traction with underground or overhead conductors, or with the rails serving as conductors. It would appear from this that all systems of electric traction have thus been antedated by Bessolo's early patent of 1855.

The Alameda Electric Railway.

The proposed Alameda Electric Railway, for which a franchise has been applied, will, when completed, constitute one of the most important enterprises of that description in the country. The road will pass through quite a number of towns on its way to San Jose. It will comprise about 40 miles of track, mostly in Alameda county, but about one-third in Santa Clara. The track will be a 42-inch gauge, the same as the Oakland, Hayward and Berkeley lines. The company thinks it wise that all the electric roads should adopt a uniform gauge. Such a course will no doubt prove of vast importance in the early future when all the principal valleys of the State will be threaded with such roads. It is expected that the road will cost about \$10,000 per mile. The cars will be similar to the narrow-gauge coaches, with motive power dummies which will be used as smoking cars, with a capacity of 20 persons each, while the cars will accommodate 40. Arrangements will soon be completed to commence construction works, which will be started at both ends at the same time.

It is the intention of the company, as soon as the road is in working order, to institute electric-light plants at all the principal points along the line—at Irvington, Alvarado, Oysterville, Mission San Jose, etc. The incandescent system will be employed.

As regards the electric motor system to be employed, that matter will be held in abeyance for the time. So rapid are the improvements being introduced in that direction that the company is desirous of utilizing the very latest improvements which may be announced previous to the time when such a decision must be made.

Local Electric Items

The triangular fight between the San Francisco and San Mateo Electric Railway Co. and the Market Street and Omnibus Railroad Companies, in regard to the control of a portion of Stanton street, is not yet over. The scene of hostilities was transferred from the street on the evening of the 4th instant to the supervisors' rooms in the new City Hall, where a wordy warfare came near resulting in one of blows. The electric company, however, had no hand in this contest, which was confined to the two cable companies. The only result that can be arrived at must be a compromise, by which all parties may be accommodated in the interest of public convenience.

The San Mateo and San Francisco electric railway will be completed, through Enreka valley, to the park in a few months. A tunnel at 18th street and Corbett road, to cost \$24,000, will be one of the most expensive engineering difficulties in the way of this construction; but it is rendered necessary to avoid hills which it will be difficult for electric cars to surmount.

One thousand and four hundred electric lights will be required to light the Doe building at Market, Hayes and Larkin streets. The Pacific Electrical Storage Company has the contract of wiring.

Col. C. F. Crocker is authority for saying that work on the Telegraph Avenue electric road of Oakland will soon be commenced. It is said that the rails have already been ordered. The work is an important one, and one of such magnitude that it has been necessary to devote much time and attention to details before commencing operations.

The Stockton Electric Company has made application for a franchise to construct an electric road from the Levee and Commerce street to Main, to Hunter, to Market, to East, and on Hunter from North to South streets. The company agrees to commence work within 60 days after the franchise is granted, and to complete two miles of the road within six months, and the rest within a year, and give the city \$60 a year for every car it runs.

The Los Angeles Board of Supervisors has received a petition for the right of way for a railroad from that city to Pasadena. The same request has also been made at Pasadena. The franchise is called for by Captain Cross, who built the first steam road between these two cities and afterward sold his road to the Santa Fe Company, by whom it is still operated.

An electric railway from Amador to Lone City is an enterprise which is fast taking shape. A preliminary survey has already been made.

An electric road has been projected over San Fernando street, Dolmas avenue and Second and John streets, San Jose. Jacob Rich has

petitioned for a franchise for the same, with a promise that work on the same shall be commenced within six months from date of charter.

The Capital City Railway of Salem, Oregon, has ordered two new cars from the Stockton works. The company has also ordered an 80-horse power dynamo to be used for power for the entire line. It will be sufficient to run sixteen cars. Improved reduction dynamos will be placed upon the cars.

Electric Lights.

A franchise has been granted to the National Electric Development Company by the Common Council of Salinas City, and a 300 light incandescent plant of their alternating transformer system will be at once installed at that place. Local capitalists will organize, incorporate and take the franchise.

Fremont will soon introduce electric lights. A company has already been incorporated, with a capital stock of \$100,000—\$79,000 of which has already been taken.

The mammoth high building, Masonic temple, of Chicago, will be lighted by one of the largest isolated plants in the world.

GOOD HEALTH.

Leucanthemum for Sour Stomach.

EDITORS PRESS:—In the issue of June 20, 1891, page 595, Good Health column, I note an article, "To Prevent Sour Stomach." Some years ago, I discovered that chewing and swallowing a leaf of the common Leucanthemum (*Leucanthemum Chrysanthemum* of Linnaeus, *Leucanthemum Vulgare*, Gray) would instantly relieve me of a "sour stomach," water breath or "heart burn." A sour taste in the mouth is at once changed by chewing a small fragment of a leaf.

For years I had been a sufferer from "sour stomach," and for relief, daily used from two to three teaspoonsful of bicarbonate of soda, but with only indifferent results.

One day I chanced to have an acid eructation when in a field away from my soda; I had just pulled from the ground a small spatulate-leaved plant that for the moment I thought to be *Leontodon* (the fall dandelion). I chewed and swallowed a small leaf of it, to see if its alkaloid would relieve me. I was surprised to find it was not bitter, but gave a flavor of water-cress, anise and licorice. I was no less surprised to find that the acid in the month, the pain in my throat and stomach, were entirely gone. I had pulled up a young seedling plant; twisting off the fibrous roots, I thrust the remaining leaves into my vest pocket, resolved to see what the result of eating a dry leaf would be; not doubting but that I would soon have another opportunity to try it. I subsequently found the plant, of which I had eaten, to be, as previously stated, *Leucanthemum Vulgare* of Gray, *L. Chrysanthemum* of Linnaeus. It was four days before another opportunity presented for testing the virtues of the plant for "sour stomach." I was riding, after eating a hearty midday meal (to which I was not accustomed), with a lady who is now in California, and one of your readers, and who is knowing to the above facts, when I had another acid rising. I took from my pocket one of the leaves mentioned above—then dry—and chewing, swallowed it; I was at once relieved from all unpleasant sensations, and found only the flavor of anise and licorice present. The lady had observed my movements and asked: "What did you put into your mouth then?" I answered: "A leaf of Leucanthemum." "Is that what you have been taking instead of soda?" said she. I replied: "I have taken only one leaf in four days, and have had no occasion for soda or another leaf till now."

"Well," said she, "give me a leaf; my dinner does not set well." I gave her one, which she quickly chewed and swallowed, and then exclaimed: "We must gather some of that, it is better than soda."

From that time I have gathered these leaves yearly, and always have them with me. To any of your readers who wish to test their virtues, and who will send an addressed and stamped envelope, I will return some of the dried leaves. Seeds and young plants can now be had for ten cents additional. I will gather and send either. Leucanthemum leaves seem to neutralize the acid ferments of the saliva, both in man and the herbivora.

I have been told that a farmer in Gorham, Me., used leucanthemum hay in the spring to correct the weakening effects of fresh grass on working oxen. A dairyman living in Medway, Mass., told me that, being short of hay one spring, he bought a rough lot that had been thought too poor for anything but hedging. It was mostly leucanthemum; the price was low, good hay was very scarce and high, but by a liberal use of shorts and cornmeal he thought he would be able to get his stock through the grass, but expected they would be in rather poor condition. To his surprise, this "poor leucanthemum hay" was eaten with a relish and without waste, and "the cows increased their flow of milk as though on fresh grass." The leaves that grow and crown the plant after flowering, when gathered, readily dry to a very brittle condition, and so remain here till spring, when they seem to gather moisture and become

tough, probably from the development of the mycelium of a microscopic fungus, a penicillium or puccinia, that, when fully developed, gives off clouds of spore dust on being disturbed.

To the question of Mr. Nelson Wade, Comptroller, Cal. (PACIFIC RURAL PRESS, July 4th, page 2), I would say: Leucanthemum would be good for bloated cattle.

Perspiration of the Human Body.

The statements in your paper are usually so correct that one can but read with surprise in issue of June 20, 1891, "Good Health" column, where you say:

"We lose about two pounds of water in 24 hours by perspiration." While some may lose as much as that in that way, more do not drink so much in that time, and a part of that which they do drink will leave the body by way of the kidneys. In the same article: "There are 27,000,000 pores on the surface of the body."

Divide that number by four, and then we would have a larger number than many physiologists concede. While no one has ever counted the pores of the whole body, portions of the skin have been examined with the microscope, and the number of pores to the square inch determined. The number varies from a minimum of 1500 on the back to a maximum of 3000 on the surfaces where they are most numerous; and this is for an average-sized human adult whose superficial area would be equal to that of a body six feet long and one foot in diameter, or nearly 20 square feet, or 2880 square inches, which gives by the maximum number of pores to the square inch, 8,640,000 as the total number; but the average number of pores to the square inch gives us only 6,450,000, and this is thought by many to be excessive. There is much misapprehension as to the real office of the pores in the skin. While they do relieve the body at times of some water, their normal function is to relieve the body of carbonic acid (CO₂) and possibly of carbon monoxide. When the elimination of these acid products of combustion by the skin is arrested by contraction of the surface capillaries, we have arterial tension and water is then forced through the skin—an exudation. There are many causes that tend to produce such a condition, such as mental states, atmospheric changes, and even excessive exposure to the sun's action, constrictions of the surface of the body, etc. The non-action of the skin is the prime cause of most diseases. Therefore keep the skin active.

G. F. WATERS

6 Somerset St. Boston, Mass.

ENGINEERING NOTES.

A PORTAGE ROUND THE DALLES.—According to the Portland papers, a proposition has been submitted to the Portland Chamber of Commerce by G. A. Lische, E. B. Dufur, T. H. Johnson and R. H. Norton, incorporators of the Dalles and Des Outes Portage Railway and Navigation Company, to build a portage railway around the obstruction in the Columbia river at the Dalles, the road to be constructed on the Oregon side of the river, and to be completed within six months from the date of the acceptance of the proposition, which is that the Chamber of Commerce take up \$250,000 of the first mortgage six per cent 50-year bonds of the company. In conjunction with the railroad a line of steamers will be put on navigable parts of the river, to connect with it. The company will guarantee a rate of freight charges on grain from any point on its system at least 30 per cent lower than any rate the Union Pacific Company may make, provided that company be not required to carry grain at less than one cent per ton per mile.

THE PIEDMONT SPRINGS WATER CO. is a new incorporation which has just come into being in Oakland. Some of the parties connected with this company have been engaged for some time in developing water in the hills back of Piedmont and the Silk Culture Station near there. Their efforts have resulted with most unexpected success, and the company has now been incorporated with a capital of \$300,000. The source of this water supply is several hundred feet above the highest point of the Piedmont cable road, and will furnish an abundant supply of water for all the region above and along the route of that road. The water is equal to the very best mountain supply, and is developed by tunnels running into the hills. No surface water enters into it. Mr. Dingee, on whose land the water is found, is one of Oakland's solid men, and the chief factor in the enterprise, which will prove of incalculable value to this, the most healthful of all the suburban localities which surround San Francisco.

A STEEL CANTILEVER BRIDGE is being built over the Spokane River, at Spokane, Wash., by the Spokane Bridge Co., of Toledo, O. The bridge has a canal height of 1135 feet, and consists of three cantilever spans, one 277 ft. four in., two 189 ft.; three steel truss spans, 105 ft., 90 ft. and 54 ft. long, respectively, and trestle approaches. The distance between centers of trusses is 30 ft., the roadway is 38 ft. 8 in., and there is an 8 ft. 8 in. sidewalk at each side. The roadway will carry double tracks for a street railway, and will be floor beams bolted together in pairs, except underneath the street-railway rails, where single 7x16 in. beams will be used. The bridge will be supported on iron trestle work piers.—*Pacific Lumberman.*



A. T. DEWEY.

W. B. EWER.

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SAN FRANCISCO:

Saturday, September 12, 1891.

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Passing Events.

Of two holidays this week, one was peculiar to California alone—the celebration of the anniversary of the admission of the State into the Union, the Pioneer Society and the Native Sons taking the lead in the celebration. Members of the latter organization went to Santa Cruz, where they had a procession, literary exercises and a general good time, representatives coming from the various counties of the State.

On Labor Day the various Trades Unions and labor organizations had a parade in the city, with succeeding literary exercises. A very good showing indeed was made by the men, the various trades being well represented.

Among the minor industries in the mineral field in this State is the new one of calcining magnesite to make magnesia, which is now being done in Napa county. The company operating there is furnishing the product for use in the manufacture of wood-pulp in Oregon and iron-making in California. Upward of 100 tons a month are being made.

The deaths are chronicled this week of several locally well-known workers in the field of mining, science, law and engineering.

The low stage of the waters in the rivers at this season is giving the river miners their harvest time. River-bed mining is not practiced to the extent it formerly was, but nevertheless there are many points where it is still carried on with more or less success.

Necrology.

U. S. Circuit Judge Lorenzo Sawyer died suddenly at his residence in this city on Monday evening. Judge Sawyer was best known to the mining community as the man who made the decision in the famous North Bloomfield debris case, the result of which was to stop hydraulic mining in this State. Many other cases of a similar nature, to enjoin the mines, have come before him, and although he was a miner himself for a brief time in 1850, in El Dorado county, his decisions were never favorable to the mining industry. Judge Sawyer was a pioneer of California and has held many positions of honor. He was City Attorney of San Francisco in 1853, and was appointed by Governor Stanford, Judge of the Twelfth District Court. In 1863 he was elected a Justice of the Supreme Court. In 1869 he was appointed Judge of the U. S. Circuit Court of the Ninth Circuit, embracing the Pacific States. This appointment was made by President Grant, and Judge Sawyer continued in the position from 1870 to the time of his death. He was 70 years of age and about to retire from the bench. Judge Sawyer was President of the Board of Trustees of the Leland Stanford Jr. University, having been connected with the trust from its formation.

P. A. Humbert, the well-known mining and civil engineer, died at Folsom on Sunday, where he was engaged in supervising the construction of the power house connected with the dam, which he also built. Mr. Humbert, a native of New York, was educated in Germany and graduated at the mining school in Freiberg. He came to California in 1876 and went to Virginia City, where he was employed as a mining engineer and as superintendent of the Ballion mine. Among other work done by him in this State was the designing and building of the jute-mill plant at San Quentin. This and the planning and constructing of the Folsom dam, canal and power house, has kept him out of mining engineering of late years. He was a nephew of August Humbert, the U. S. assayer of this city, who issued the first \$50 gold "slugs" coined in San Francisco in early days.

John A. Townsend, an old and respected citizen of Nevada county, died suddenly last week while at work in the Holbrook gravel mine at Randolph Flat. Death resulted from heart disease. Mr. Townsend was an old resident of Grass Valley and one of the best of miners. He was for several years foreman of the Empire and other mines of the district. He was a native of Pennsylvania, aged 64 years. Mr. Townsend used to work in the lead mines of Galena, Ill., before he came to California. When he came here in 1850 he went to work in the mines of Placer county. He was at one time superintendent of the St. Patrick mine, near Ophir, Placer Co., but most of his life in this State has been passed in the mining fields of Nevada county.

Dr. George Hewston, one of the best known of San Francisco physicians, died at his home in this city, on the 4th inst., of Bright's disease. He was 64 years of age. Dr. Hewston was for several years Secretary of the California Academy of Sciences, and for the past three years has served as second vice-president of that body. He was a prominent student of the subject of Zoophytes, and in this department made valuable additions to the Academy's collection. Dr. Hewston at one time had the largest and most valuable private library in this city, and was always an ardent book collector. He was a brother of General John Hewston, of the old assaying firm of Kellogg, Hewston & Co. Dr. Hewston was a graduate of the University of Pennsylvania, and was Demonstrator of Anatomy in the Philadelphia College of Medicine for a year. He was always one of the active workers in the Academy of Sciences here.

Peter Bargion, the inventor of the Bargion rail, died at his home in East Oakland last Saturday. The deceased was a well-known resident of Oakland, and acquired some distinction for being the inventor of the combination street rail that bears his name. The rail is in use on a section of the local road, and has proved a success wherever tested. The patent was sold to a syndicate.

THE Comstock mine pay-rolls last month aggregated \$196,781. The largest expense to one mine was the Con. Cal. and Virginia that paid for labor, \$36,311. The quartz mills paid out \$24,000.

Ozocerite in Oregon.

We were shown this week, by Mr. Melville Attwood, some specimens of a peculiar ozocerite from a recently discovered deposit in Southern Oregon. The mineral has a very different appearance from that found in Utah. It burns very freely, with a dense smoke but no odor. If the deposit is of any extent the discovery is an important one, since it is found in only one other locality in this country. The Utah ozocerites began to come into the market in 1888, and the deposit is now producing about 300,000 pounds a year.

This mineral wax or ozocerite in its refined form is used for nearly all the purposes to which ordinary beeswax is applicable. It possesses nearly all the properties of beeswax except stickiness, but in cases where that quality is desirable it is only necessary to wax the mineral with ordinary beeswax. Grade ozocerite, like other hydrocarbon compounds, is used to a considerable extent as an insulator for electrical wires. Ozocerite belongs to the series of hydrocarbon compounds which include marsh gas, petroleum and paraffin, it being very similar in appearance to the latter. It is colorless to white when pure. It occurs leek-green, yellow and brown.

This Oregon mineral wax is a yellowish white. Its specific gravity is very small, it being exceptionally light for its bulk. From appearance it is a purer article than that produced in Utah. Mr. Attwood has promised us the details of his examination when it is concluded.

We import large quantities of this material from Galicia, Austria, the amount, according to census reports in 1889, being 1,078,725 pounds valued at \$36.68. There are 35 companies at work in Galicia where they have been mining the substance since 1862. They had a monopoly in the product until 1888 when the Utah deposit began to be worked. If there is much of the substance in Oregon it will be worth attention as the demand for it is on the increase.

Foundry Notes.

It is noticeable to any one visiting the foundries and machine shops of this city that marine and electrical work at present "have the call," whereas formerly the bulk of the heavy work in the shops was in the mining line almost exclusively. More or less mining machinery is constantly being made, but nearly all the large mines within reasonable railroad distance from San Francisco are supplied, and repair work is about all we get, except in the case of new mines. The Great Northwest mine gets its supplies in this line from east of the Rockies, freight rates being more favorable from that direction.

In the building of cable and electric roads, however, the foundries of this city are called on for heavy machinery as well as smaller parts in quantities. The largest engines lately built here have been for an electric road. For electric lighting and power purposes, engines or water-wheels must be supplied, as well as dynamos and motors, and these plants necessarily give jobs of greater or less extent to our foundries. Many of the interior towns are now utilizing electricity for lighting purposes and the heavier engines for the dynamos are made in this city.

The largest jobs in our largest foundries are to a great extent connected with marine engineering. The steam coasting schooners which have so largely taken the place of the sailing vessel at our coast ports, bring to the foundries plenty of work. Those in commission have been very successful and those built lately have been of larger size. They need engines, boilers, propellers and all sorts of machine work upon them. Moreover, there is always more or less repair work on larger steamships visiting this port.

The ship-building interests of California are gradually enlarging from year to year, and this brings naturally an increase of marine work at our local shops. The class of work turned out is not excelled elsewhere and has always proven satisfactory to purchasers.

WYOMING MINING CONVENTION.—The second annual State Mining Convention opened at Cheyenne, Monday, with a good attendance and a great display. Each of the Wyoming counties sends coal oil, asbestos, gold, silver, copper and iron specimens.

Handy List of Mining Books.

Part 4 of "Handy Lists of Technical Literature" is a list of books on mines and mining, including assaying, metallurgy, minerals, mineralogy, geology, paleontology, etc. It is an alphabetical reference-catalogue, arranged under authors and subjects, and including analytical references to the contents of important works, compiled by H. E. Haferkorn. The list includes issues from 1880 to May, 1891, and a number of earlier books often met with in catalogues; also a short list of German works. For librarians, booksellers or technical workers this list is invaluable. It will be specially appreciated by those who have found it somewhat irksome, in searching for the literature of a particular subject, to look up successively the books under a long series of numbers, when frequently the author's name or the title of the work, if given as it is in these lists, is sufficient guide for eliminating works that are not wanted.

The compiler has taken unusual pains and spent an immense amount of labor in order to make this catalogue as complete as possible. Mining men and metallurgists in search of the literature of any special branch in which they are interested are here aided and guided, and can go to a library and find exactly what they want without losing time looking over books or general catalogues. In purchasing, the size and cost of book is indicated, and a separate key gives the names of publishers. The price of this "Handy List" is \$1.25, cloth-bound, with key to publishers; without key, \$1. We can procure the book at these prices for all who may order it.

The Astronomical Society.

The meeting of the Astronomical Society of the Pacific was held at the Lick Observatory on Sept. 5th. The Directors meeting was held from 5:30 to 6 o'clock the same day, and 25 new members were elected, as follows: Robt. S. Avery, Washington, D. C.; R. L. Bischoffheim, Paris, France; Mrs. E. E. Cook, Davenport, Ia.; A. L. Edwards, N. Y.; T. A. Hagerty, John P. Hely and K. Himrod, Chicago; Wm. Hoskins, Lagrange, Ill.; Mrs. M. M. Johnson, Circleville, Utah; Prof. J. H. Kedzie, Evanston, Ill.; Prof. Malcolm McNeill, Lake Forest, Ill.; Beverly K. Moore, Boston; Miss Pendleton, Phila.; Mrs. W. G. Preston, Boston; Miss M. J. Turner, Quincy, Mass.; Prof. J. M. Taylor, Seattle, Wash.; J. M. Van Slyke, Madison, Wis.; David Hughes, Mrs. Anna L. Hewes, Frank McMillen and D. O. M. Blake of San Francisco; F. H. Whitworth, Seattle, Wash.; Miss Mary E. Wilson, Oakland; J. Henry Turner, Woodville, Pa.

The membership of the society is now 420, of whom 44 are life members. This is the largest membership of any scientific society on the Pacific Coast.

At the meeting in the evening, when President W. M. Plerson presided, the Secretary announced that 38 presents had been received since the previous meeting, and the thanks of the society were voted to the donors.

The following papers were presented: Measurement of Jupiter's Satellites by interference methods, by Prof. Michelson, of Clark University, Mass.; Enlarged Drawings from the Moon-negatives of the Lick Observatory, by Prof. Weinek, Director of the Observatory of Prague; catalogues of the library of the Society, prepared by Otto Von Geldern; Observations of Jupiter and of his Satellites with the 36-inch equatorial of the Lick Observatory (1888-1890); the Observatory of the U. S. Military Academy at West Point, by Lieut. Harlow, in charge. The first named paper only, was read, by Prof. Campbell. After adjournment the members and their friends were given the use of the 12 and 36-inch equatorial and made the most of the superb night.

CALIFORNIA ELECTRICAL SOCIETY.—N. S. Keith delivered before the California Electrical Society last Monday evening his third lecture in a series on the "Evolution of the Arc Lamp." He described the first form of arc lamp used more than a century ago, illustrating his remarks with drawings showing the gradual improvement in this lamp down to its present state of perfection. In conclusion he compared the various arc lamps now in general use, showing the mysteries of their complicated construction.

In the PRESS of August 223 last were given engravings of the blast furnaces at Elschweiler and Horde, taken from Dr. Wedding's paper

on *c. f.* Fig. 1; Fig. 4 is a half-section on *a. b.* Fig. 1, and Fig. 3 is a section on *g. h.* Fig. 1. Dr. Wedding says that the essential improvements in puddling have not been in mechanical reblowing (though this has been done in

many), but rather in the more complete utilization of fuel, by means of gas-firing and double furnaces. Two furnace designs deserve special mention in this connection: that of Springer, with fixed hearth and reversible flame; and

to a very high temperature in the regenerators, passes from the puddling-hearth to the melting-hearth. The regenerators are in front of or under the furnace, as usual, and vertical or horizontal. This furnace may be used with di-

Fig. 1.

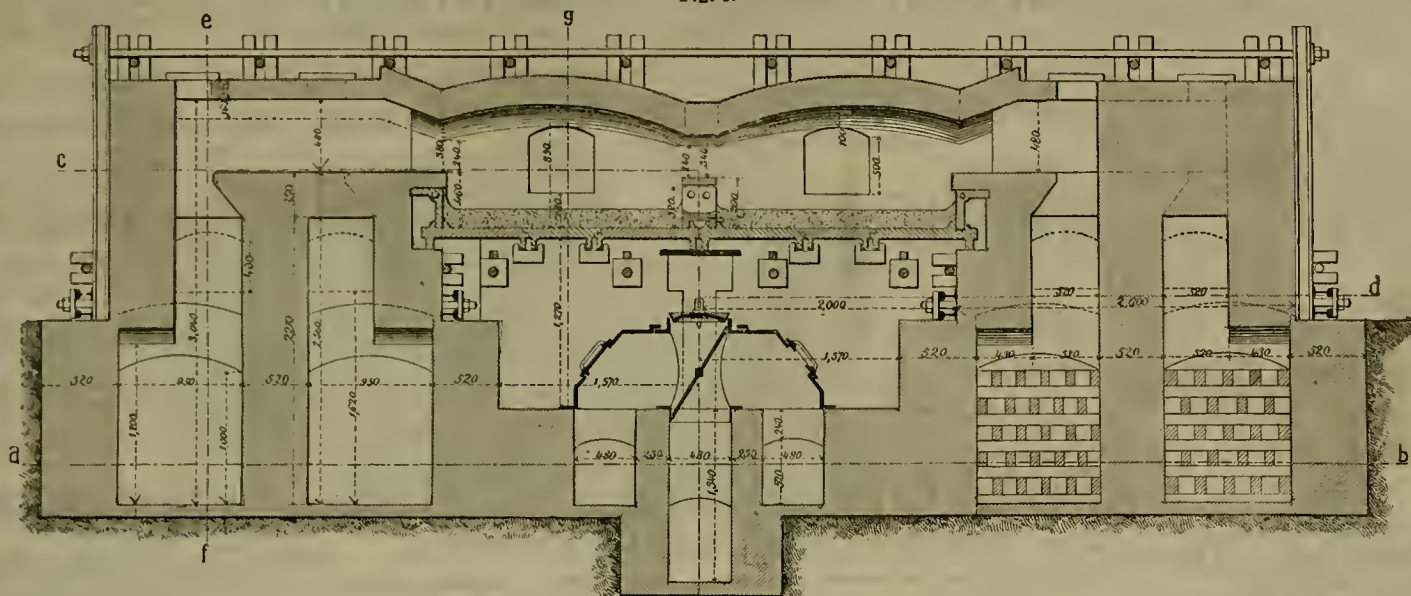


Fig. 2.

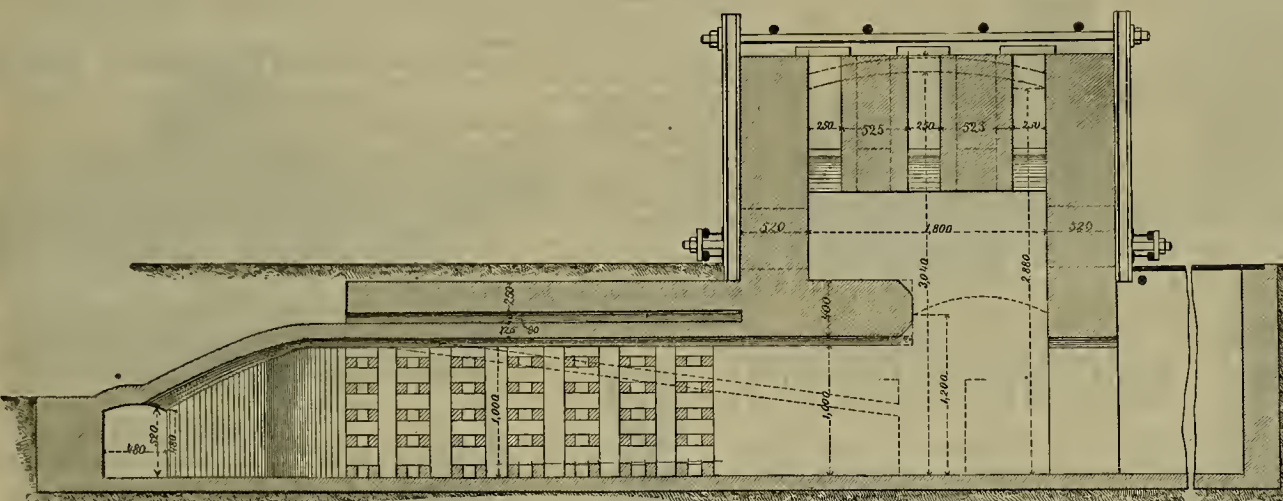


Fig. 4.

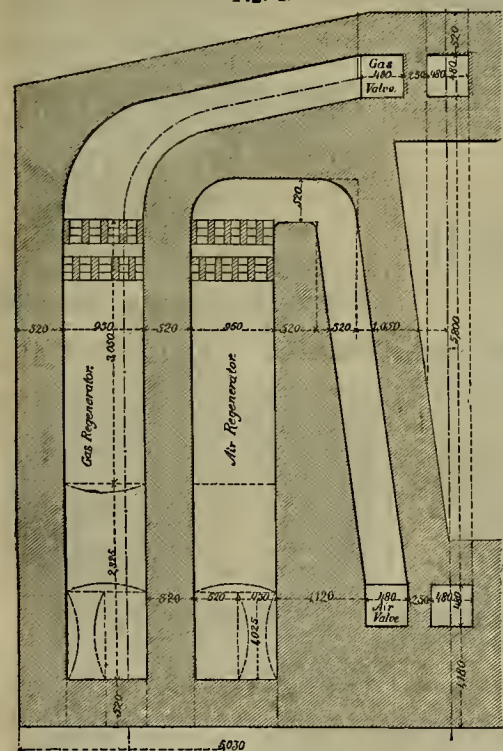
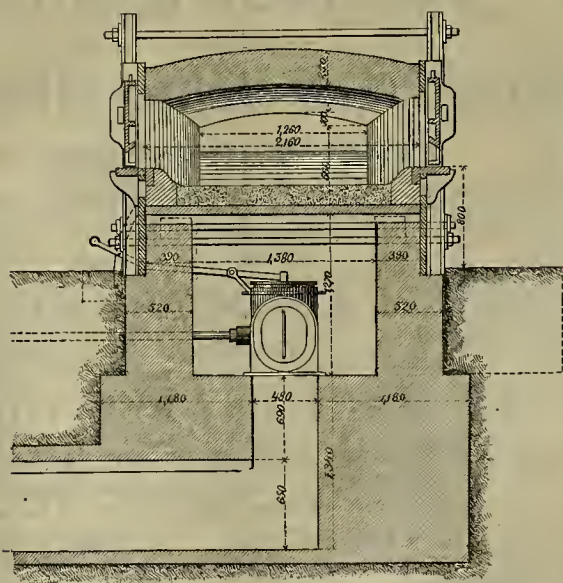


Fig. 3.



reot firing or with gas-firing, and is shown in the figures as constructed for gas-firing. It has done excellent work, even with lignite as a fuel. It has but a single disadvantage, namely, the dependence of the two hearths on one another; and this led to the invention of the Pietzka furnace (illustrated in the MINING AND SCIENTIFIC PRESS, August 8, 1891, page 89). While in operating the Springer furnace the flame is reversed only when the puddling in one hearth and the melting in the other are finished (or, in other words, must go in one direction as long as the puddling process lasts, even though by reason of any delay or prolongation of the process, the regenerators may be more or less cooled), this objection is obviated in the Pietzka furnace, where the flame maintains one

direction, yet the hottest flame always strikes the hearth in which puddling is going on.

Mining Magnesite.

In another column of the PRESS is a letter of a correspondent describing a mine in Napa county, where they are taking out magnesite and calcining it for the market. A sample of the mineral has been sent us by the owners of the mine. The magnesite is in the form of magnesite, and is hard, white and flinty. The component parts, according to Prof. Hanke's analysis, are about 43 per cent carbonic acid, 50 per cent magnesite and seven per cent silica, iron, lime and moisture. It occurs in ledges from two to six feet in thickness, apparently running deep, and extending upward of half a mile, as marked by heavy surface croppings. The rock is blasted out, as in a quarry, and broken to a size suitable for a furnace. The kiln is continuous, and has a capacity of five tons of calcined ore per day of 24 hours.

The owners of the mine have a contract with the Willamette Pulp & Paper Co. to deliver them 40 tons of calcined ore per month for two years, and delivery has been commenced. It is used at the company's works at Oregon City, Oregon, in the treatment of sulphite fiber in the manufacture of wood-pulp.

The Pacific Rolling Mills in this city also use the calcined rock as a flux in the furnaces. The Pacific Reduction Works of this city also use the best quality of the raw rock in their operations.

The output of the mine and kiln is now 125 tons of calcined ore per month. This will be reduced in the winter season and again increased next summer. The mine is $1\frac{1}{2}$ miles from the south end of Child's valley, 11 miles from Rutherford, Napa Co.

WATER is scarce for milling purposes on the
Carson river, Nev.

SPRINGER DOUBLE PUDDLING FURNACE WITH REVERSING FLAME, AT KONIGIN-MARIENHUTTE.

read before the American Institute of Mining Engineers. On this page, from the same source, we reproduce cuts of the Springer double puddling-furnace, with reversing flame. Fig. 1 is a section; Fig. 2 is a section the district of Saarbrücken and in Lorraine, without, however, changing the old construction, nor in the use of the rotary mechanical puddler (which, apart from a few small experiments, has never obtained a footing in Ger-

that of Pletzka, with constant direction of flame and reversible hearth. Springer's furnace has two hearths, placed end to end, one of which is charged with pig, as the iron begins to come to nature in the other. The flame, brought

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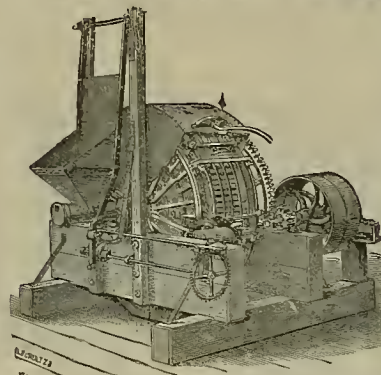
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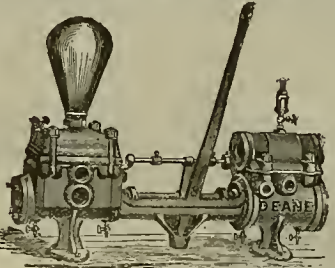
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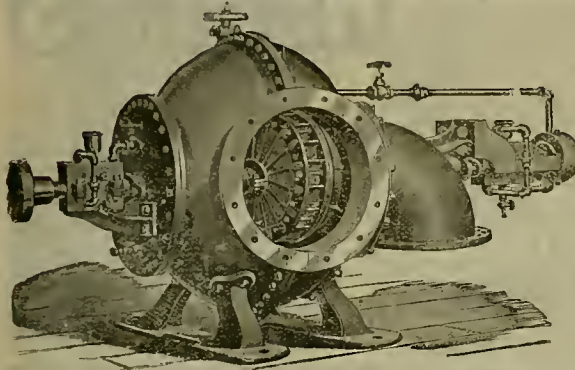
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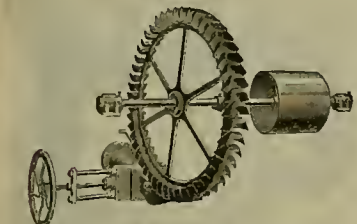


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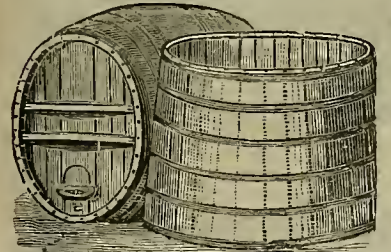
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Union Cons M Co., Nevada.	44	25c.	Aug 31, Oct 5, Oct 25.	A V Norman.	309 Montgomery St
Yellow Jacket M Co., Arizona.	49	50c.	Oct 1, Oct 19, Oct 22.	A Waterman.	309 Montgomery St
Yellow Jacket M Co., Nevada.	49	50c.	Aug 31, Oct 2, Nov 7.	W H Blauvelt.	Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Evening Star M Co.	J J Scoville.	320 Sansome St.	Annual.	Sept 24
Gaud Prize M Co., Nevada.	R R Grayson.	331 Pine St.	Annual.	Sept 15
Gray Eagle M Co., California.	A W Barrows.	303 California St.	Annual.	Sept 15
Mineral King M Co., Nevada.	J E Norman.	309 Montgomery St.	Annual.	Sept 15
Pacific Coast Borax Co., California.	A H Clough.	320 Montgomery St.	Annual.	Sept 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co., Nevada.	T Wetzel.	320 Sansome St.	10.	Aug 15
Cocoas Cal & Virginia M Co., Nevada.	A W Havens.	309 Montgomery St.	50.	Aug 17
Copita M Co.	E M Hall.	314 Montgomery St.	30.	Sept 10
Idaho M Co., Grass Valley.		Grass Valley.	3 00.	Aug 4
Mayflower Gravel M Co., California.	D M Kent.	330 Pine St.	50.	Aug 24
North Banner Cons M Co., California.	T J Mitchell.	Grass Valley.	50.	Aug 20
North Commonwealth M Co., Nevada.	J W Pew.	310 Pine St.	25.	June 17
North Star M Co., California.	D A Jennings.	401 California St.	50.	Aug 8
Pacific Coast Borax Co., California.	A H Clough.	320 Montgomery St.	1 00.	Sept 10

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb.	@ 13	English, b.	@ 16
Refined, in cask.	@ 8	Six Diamond tool	@ 20
Powdered, do.	@ 8	Pick & Hammer.	@ 10
Concentrated, do.	@ 7	Machinery.	@ 5
All grades jobbing at advance.		Tool Oalk.	@ 4
COPPER.		IRON.	
Brit.	@ 22	B. V. steel grade	@ 21
Sheathing.	@ 22	14x20, spot.	@ 7 00
Ingot, jobbing.	@ 15	Charcoal, 14x20.	@ 7 00
Do, wholesale.	@ 14	Do roofing, 14x20.	@ 6 50
Fire Box Sheets.	@ 24	Do, 20x28, 14x20.	@ 6 00
LEAD.		ZINC.	
Bar, base.	@ 3	Irregular, nominal.	@ 21
Norway, base.	@ 4		
SILVER.		SILVER.	
Pro Iron.	Spot.	Lead, spot from yard—per ton.	
England 99.	27 00	27 00 Wellington.	\$9 00
Glenbrook.	28 00	28 00 Greta.	8 00
Am. Soft.	1.23	30 00 Oarion Hill.	8 00
Oregon Pig.	23 50	30 00 Nantimo.	9 00
Pure Sound.	27 00	30 00 Gilman.	7 00
Clay Lane White.	23 00	24 00 Seattle.	7 00
Shots.	21 00	20 00 Coos Bay.	6 00
Longan.	25 00	26 00 Channel.	9 50
Thorncliffe.	26 00	23 00 Egg, hard.	14 00
Cartier.	26 00	26 00 Cumberland, in sacks.	14 00
Barrow.	26 00	26 00 Do, bulk.	13 00
Cargill.	23 00	26 00 Wall end.	9 00
CHROME IRON ORE.		SCOTCH SPLIT.	
Per ton.	@ 10 00	Scotch Split.	@ 8 00
LEAD.		BRYN.	
Pig.	@ 4	Wheatley.	@ 8 00
Bar.	@ 5		
Sheet.	@ 7		
Pipe.	@ 6		
SILVER.		SILVER.	
(Discount 10% on 500 bags.)		Lehigh Lump.	@ 14 00
Drop, bag.	@ 1 90	Cumberland, 10 00.	@ 14 00
Buck, bag.	@ 2 30	Egg, hard.	@ 12 00
Chilled, do.	@ 2 30	West Hard.	@ 7 50
QUICKSILVER.		COKE.	
By the flask.	@ 41 00	English, to load.	\$9 00 @ 11 00
Flasks, old.	@ 40	Do, spot, in bulk.	@ 12 00

Eastern Metal Markets.

By Telegraph.

New York, September 10.—The following are the closing prices the past week:	
Silver in Silver	
London.	New York.
Thursday.	45 16
Friday.	45
Saturday.	44 1/2
Monday.	45
Tuesday.	45 1/2
Wednesday.	45 3/16
Borax is higher owing to credited reports of reduced supplies from the Coast, concentrated sales at 7 1/2 in car lots. Quicksilver is steady at 60c. Iron is firm with a good strong tone. Copper has an advancing tendency.	

Sales at San Francisco Stock Exchange.

THURSDAY, September 10, 9:30 A. M.	
100 Belemer.	1.65
200 Belemer & Belcher.	3.50
200 Belemer.	3.50
250 Bullion.	2.10
50 Chollar.	1.30
300 Con Cal & Va.	6.57 1/2
200 Con Imperial.	1.00
100 Con New York.	3.15
100 Coptis.	1.50
50 Crown Point.	1.65
100 Exchequer.	70c
450 Gould & Curry.	1.90 @ 1.95
100 Hale & Norcross.	1.85
500 Julia.	1.00
200 Justified.	1.50
100 Mexican.	2.50
150 Ophir.	3.95
150 Overman.	1.30
30 Potosi.	3.00
200 Sierra Nevada.	3.15
135 Sierra Nevada, 3.15 @ 3.20	
250 St Louis.	20c
100 Utah.	70c
250 Yellow Jacket.	1.30

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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R. G. BAILEY—San Francisco.
Ben Thompson—San Francisco.
Geo. Wilson—Sacramento Co.
J. H. CROSSMAN—Perris, Cal.
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SEVERAL miners are at work on some of the antimony mines located in the southern end of the Toiyabe range in Nye county, Nev.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING AUGUST 20.	WEEK ENDING AUGUST 27.	WEEK ENDING SEPT. 3.	WEEK ENDING SEPT. 10.
Alpha.	.75	.80	.75	.65
Alta.	.55	.60	.55	.50
Andes.	1.15	1.35	1.15	1.20
Belemer.	1.40	1.55	1.25	1.30
Belle Isle.	.40	.45	.40	.50
Best & Belcher.	3.4	4.05	3.15	3.55
Bullion.	2.75	3.40	2.75	3.00
Bulwer.	.60	.70	.60	.65
Bodie Co.	.25	.30	.25	.25
Commonwealth.	.85	1.15	.85	.90
Con. Va. & Cal.	6.87	8.12	5.87	6.75
Challenge.	1.10	1.20	.90	1.00
Chollar.	1.30	2.40	2.00	1.85
Crown Point.	1.30	2.00	1.65	1.85
Crocker.	.40	.45	.40	.40
Eureka Co.	3.40	4.05	3.40	3.70
Exchequer.	.50	.65	.40	.70
Grand Prize.	.15	.17	.10	.15
Hale & Norcross.	1.80	2.05	1.75	1.80
Julia.	.15	.15	.10	.10
Justice.	.65	.70	.60	.65
Kentuck.	.30	.35	.25	.30
Lady Wash.	.30	.45	.30	.35
Mexican.	2.35	2.60	2.10	2.25
Navajo.	.35	.40	.20	.20
North Belle Isle.	1.10	1.15	.90	1.00
Ophir.	3.60	4.30	3.40	3.85
Overman.	1.65	1.90	1.60	1.65
Potosi.	3.25	4.50	3.35	3.90
Peerless.	.10	.10	.10	.10
Peer.	1.70	2.55	2.15	2.50
S. B. & M.	.75	.75	.70	.70
Sierra Nevada.	3.30	3.30	3.50	3.25
Silver Hill.	.15	.15	.15	.15
Scorplon.	.35	.35	.35	.35
Udon Con.	2.60	2.75	2.35	2.50
Utah.	.50	.55	.75	.75
Yellow Jacket.	1.60	1.85	1.50	1.70

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ANNUAL MEETING.

THE REGULAR ANNUAL MEETING OF THE Stockholders of the Pacific Coast Borax Company will be held at the office of the Company, 320 Montgomery Street, Room 11, San Francisco, California, on MONDAY, September 21st, 1891, at the hour of 1:30 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting.

EVERY one in need of information on the subject of advertising will do well to obtain a copy of "Book for Advertisers," 368 pages, price one dollar. Mailed, postage paid, on receipt of price. Contains a careful compilation from the American Newspaper Directory of all the best papers and class journals; gives the circulation rating of every one, and a good deal of information about rates and other matters pertaining to the business of advertising. Address ROWELL'S ADVERTISING BUREAU, 10 Spruce St., N. Y.

Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of August, 1891, an assessment, No. 25, of Five (5) Cents per share, was levied upon the Capital stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of September, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 8th day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

ANNUAL MEETING.—THE REGULAR Annual Meeting of the Stockholders of the Inyo Marble Company will be held at the office of the Company, No. 137 Montgomery Street, San Francisco, California, on THURSDAY, the Tenth day of September, 1891, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books close on Monday, September 7th, at 2 o'clock P. M.

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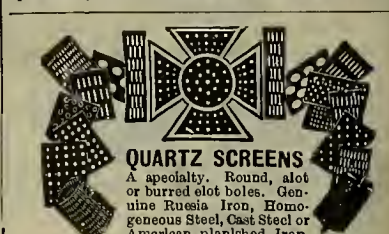
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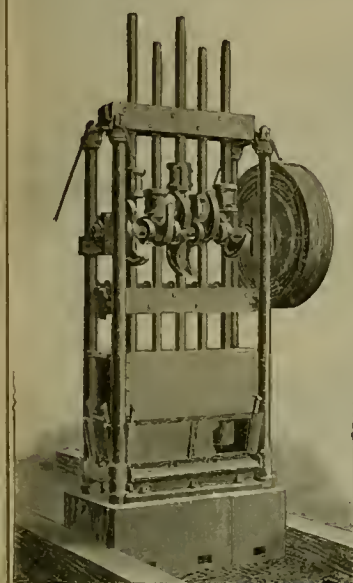
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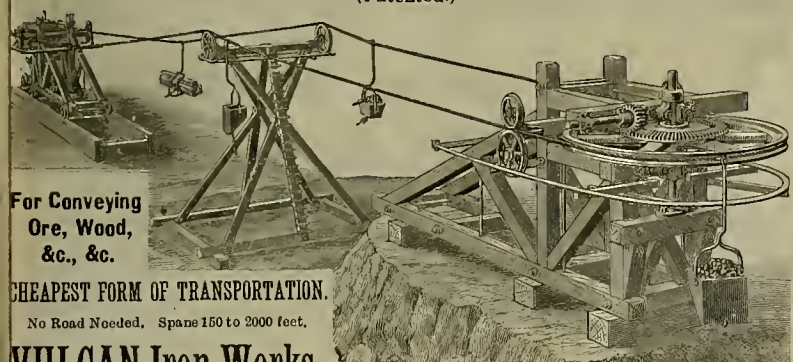
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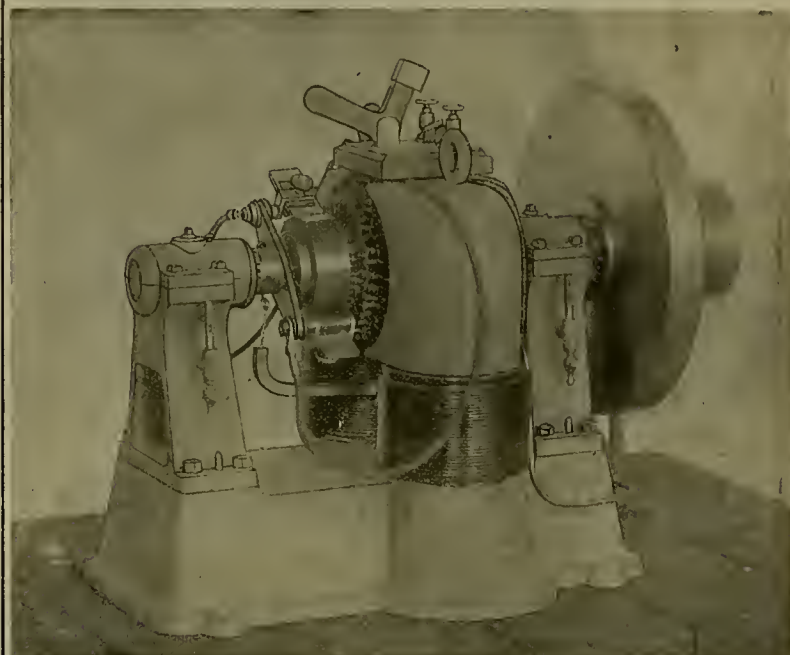
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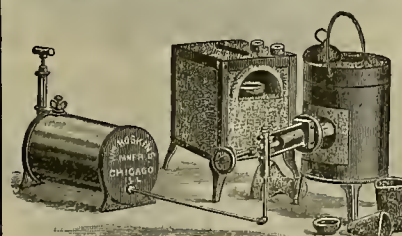
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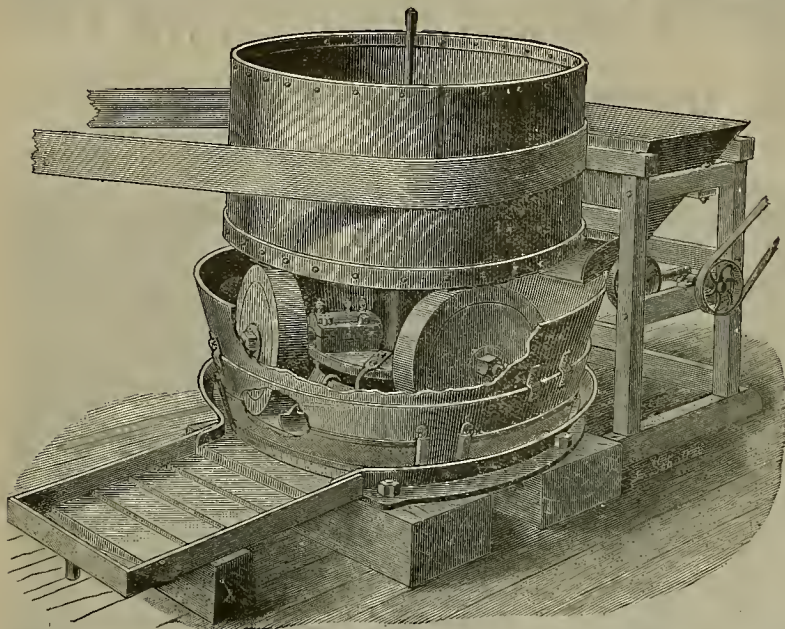
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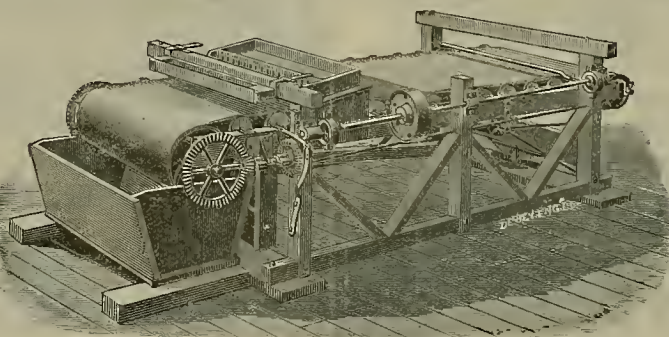


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Patented Oct. 9, 1888, and Dec. 1890.

ANGELS, CALAVERAS COUNTY, Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON GARRARD,
Supt. Gold Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6, 1890.
Mr. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about it. "Letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.



ANGELS, CALAVERAS Co., Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours,
T. M. LANE, Supt. Madison Mine.

ANGELS CAMP, July 25, 1891.
Mr. JAMES TULLOCK—Dear Sir: We are working sulphurets from mines in Calaveras and Toulumuc Cos. We find the sulphurets saved on your machines cleaner than those saved on any other. Yours truly,
THOS. N. SMITH, Supt. Utica Chlorination Works.

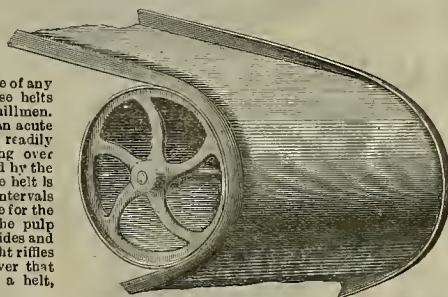
Price, \$450.

For further particulars, address **JAMES TULLOCK, Angels, Cal.**, or
Risdon Iron and Locomotive Works,
Cor. Beale and Howard Sts., San Francisco.

THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco, we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffling also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

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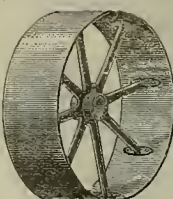
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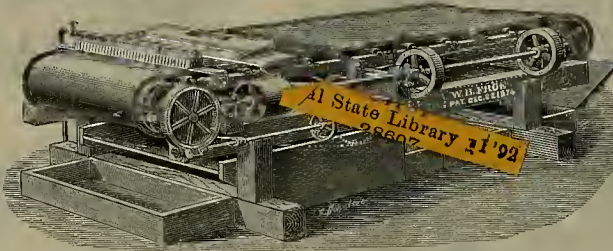
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



PROTECTED BY PATENTS—September 2, 1879, April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

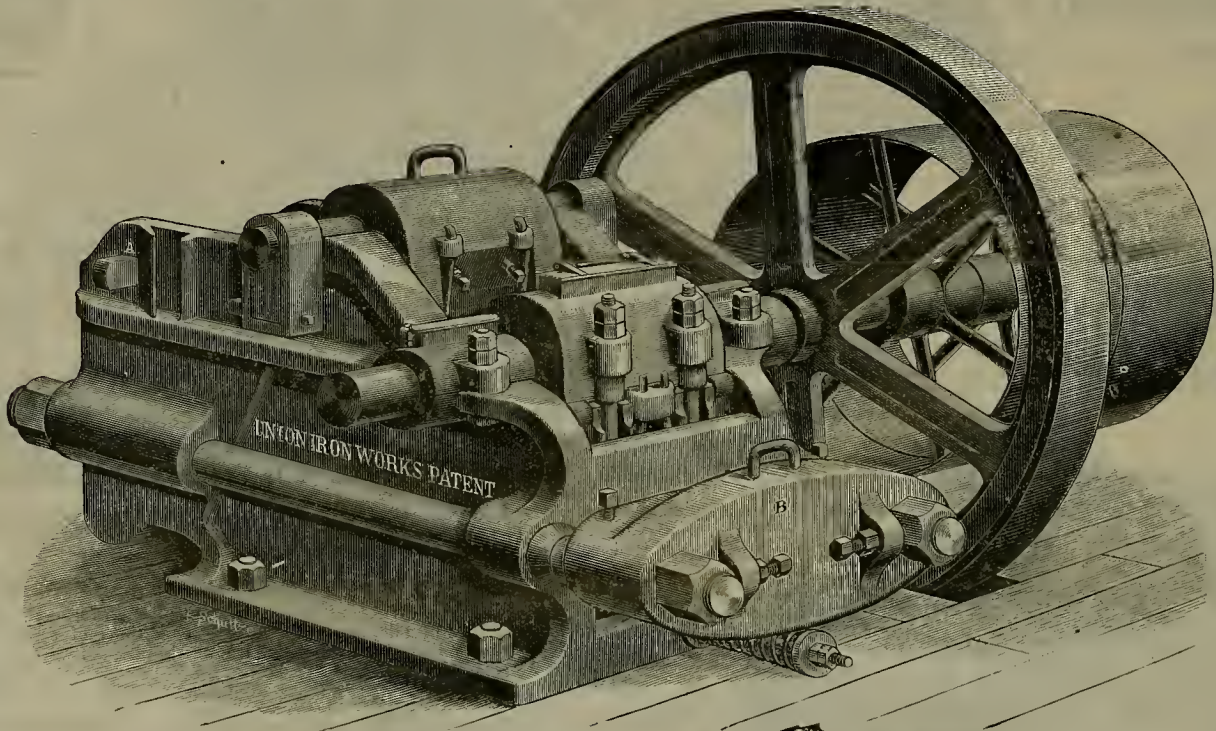
Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

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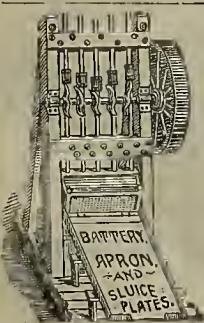
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 12.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 19, 1891.

Three Dollars per Annum
SINGLE COPIES, 10 CENTS.

The Folsom Dam.

An Immense Water-Power Plant.

The immense masonry dam across the American river at the Folsom State Prison, which the Folsom Water Power Company has, with the aid of convict labor, been so many years erecting, is completed and we, in this issue, present to our readers a few engravings made direct from photographs, showing the massiveness of the structure and the heavy body of water which for many months of the year pours over its crest. There is no stronger structure of its kind than this in the United States. It is built on the solid granite bedrock of the river, and upward of 20,000 barrels of the best English cement was used in its construction. This dam is 89 feet high, 87 feet wide on the bottom and 24 feet wide on the top, and with the bulkheads on either end, measures upward of 650 feet in length. It contains 48,590 cubic yards of granite masonry, composed of granite blocks each many tons in weight. The front and back faces are laid up in courses with a rubble filling, composed of large rock laid in concrete between. For 185 feet in length, the center of the dam has been left six feet lower than the sides. Into this depression will be fitted a wooden movable dam or shutter, hinged to the top of the dam. This shutter will remain down, or flat, upon the top of the dam during most of the year, but during the short stage of low water in the fall will be raised by five hydraulic jacks set in the masonry, in order to make a storage reservoir six feet deep to save the flow of water in river during the hours of the night, and to provide a pond in which to float logs.

A heavy granite wall extends from the dam, forming the outer bank or line of the canal, for a distance of nearly a mile. The wall measures upward of 15,000 cubic yards. About 1200 feet below the dam, on the east side of the river, is located the Folsom State Prison. At this point the level of the canal drops about eight feet to afford to the State, in payment

(Continued on page 185)



VIEW OF EAST SIDE BULKHEAD DURING CONSTRUCTION FOLSOM WATER POWER CO.'S DAM.



VIEW OF THE FOLSOM WATER POWER CO.'S GRANITE DAM ON THE AMERICAN RIVER.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—*Eds.*

Nevada County Mines.

NUMBER 1.

[From Our Traveling Correspondent.]

Grass Valley.

Grass Valley is so well known as the leading gold mining section of the State that it is not necessary to prove the fact that her mines are the deepest, veins the most numerous, and ore values the highest of any gold quartz mining camp of California. At this time several of the large mines have run into a barren section, and until it is gone through the mines will not be on a dividend basis. This is an old experience in this camp, but as the mines have always come out all right, when the development is carried to a sufficient extent, the mine-owners no longer regard it as an indication that the mine has given out.

The Idaho.

The Idaho, of which Edwin Coleman is superintendent, still keeps up her dividends, as the last was \$3 a share. She may be said to be doing very well for a "worked out" mine that has produced close on to \$11,000,000. At this time the mill is dropping 20 of her 40 stamps. The vein has been followed on its pitch for a distance of 3000 feet, or 2000 feet vertically, making it the deepest gold mine in the United States. That it has paid to this depth is an encouraging feature for all of the other mines in this section. The shaft is going on down from the 3000-foot level in search of additional wealth. The ore at this writing is from the 1800-foot level. On the east end of the mine a prospecting shaft is being sunk and is now down 160 feet in the country rock. This shaft will be continued until a depth of at least 700 feet is secured and the vein thoroughly prospected to that depth. If there is a shoot of good ore in that end of the mine, this shaft will find it, and if found the Idaho will renew her youth and be good for continued dividends for 20 years to come.

The Maryland.

Mr. S. P. Dorsey the superintendent of this mine, is quietly but persistently pursuing a course of development that will soon show whether the mine is a second Idaho. The fact that the mine is the extension of the Idaho, makes the work on the Maryland of more than ordinary interest to all parties. Mr. Dorsey has repeatedly refused the most tempting offers for his property, but has preferred to hold and prospect the mine, believing that in time he can show a vein as high in grade as that of its companion, the Idaho.

The Brunswick.

The Brunswick, E. Fitzgerald superintendent, disputes with the Maryland the possession of the Idaho vein, claiming that the vein passes into the Brunswick and not the Maryland mine. As that as it may Major Fitzgerald has opened up a large vein of high grade ore that can speak for itself and needs no parentage, as it can stand alone.

The Crown Point.

A Gauthier is superintendent and owner of the Crown Point. It has a 7-foot vein of \$17 ore. The mine is idle owing to the inability of the owner to erect the necessary hoist and pumping plant, that on the mine being but little better than none at all. The vein has been sunk on to a depth of 400 feet, and the ore proved to be of an average value of \$17 a ton. If this mine was properly equipped and developed with competent management, it should become one of the best mines in this section and the writer would like to have charge of it.

A Vibrating Amalgamating Table.

Mr. Gauthier has in operation at his mill his "vibrating amalgamating table." This is simply an attachment to the usual table by means of which the table is given a rapid vibrating motion. This motion holds the quicksilver on the plates, as high as 30 pounds being placed on at one time without loss. Then, too, the tables can be placed almost level, and but very little water is required, as the vibration carries off the sands. Careful tests show that the table saves 10 to 15 per cent more free gold than the stationary table. In fact, the concentrates below the vibrating table are but half the value of those below the ordinary stationary plates. This is an important fact in the working of ores containing low-grade sulphurets. If the table will save one-half their assay value, the other half can be run down the tail-race and a greater profit obtained than by chlorinating the whole at an expense near the value of the sulphurets.

The Empire.

The Empire, G. W. Starr, Supt., is now down over 2000 feet. A crossing of granite has been encountered, and while the vein continues on down through this, the gold is shy of it. In the W. Y. O. D., which parallels the Empire, a granite country was encountered in which the vein was almost barren; but in sinking a few hundred feet, this granite belt was passed through and slate struck, in which the vein regained its gold value. No doubt the Empire has struck this granite belt, or ore like it, and the sinking now being done will in time bring the vein into slate and pay ore. In the

meanwhile, the mill is dropping 40 stamps on low-grade ore.

The W. Y. O. D.

At this mine, of which C. A. Brockington is superintendent, the old five-stamp mill is clattering along and paying for all improvements. These improvements are on a good scale, and when completed, will place the W. Y. O. D. with the best mines of the camp. The shaft is being changed to three compartments, and will be continued on down without let up until a depth of 1500 feet is reached. The shaft is now down 850 feet and shows a four-foot vein of quartz that averages \$63 a ton. The ore shoot has been drifted on 170 feet and not gone through. This makes the W. Y. O. D. the richest mine in the district at this time. The improvements are about completed. The old mill that has ponred out dividends of \$5000 a month with five stamps will give way to a complete ten-stamp mill, equipped with every device for the rapid and economical handling of the ore and the saving of a higher percentage of the ore's value than was possible in the old mill. The crushing capacity of this mill will be treble that of the old one. A fine steam hoist is also being erected, that will sound the vein to a depth of 3000 feet. The plant on the mine is being erected by the well-known millwrights, Messrs. W. C. D. Body & Bro., whose reputation is sufficient guarantee that the plant when completed will be satisfactory in every particular. Messrs. Body should be credited with the erection of the North Star, Empire, Banner and Mt. Auburn mills; also the remodeling of the Idaho mill and the works of the Grass Valley Gold Extracting Co.

The North Star.

The superintendent of the mine is not allowed to give any information in regard to the property, and as the writer does not care to give it second-hand, I will simply state that the mill is one of the finest in the State, and the mine one of the largest dividend-payers of the Grass Valley section. The shaft is down 2300 feet.

The Omaha Cons.

The Omaha, Geo. Mainhart, superintendent, has a vein running from ten inches to two feet of ore that averages \$20 a ton in free gold, and carries 40 per cent of \$75 to \$80 a ton sulphurets. The 28-stamp mill is running regularly, crushing $1\frac{1}{2}$ tons to the stamp.

The Menlo Cons.

Mr. Lakeman is superintendent of this company. The mines are the Homeward Bound, Wisconsin and Illinois. The shaft on the Wisconsin is now down 200 feet, and will be continued for 300 additional feet. The vein is now from 9 to 12 inches in width of \$30-ore. On the Homeward Bound the shaft is down 300 feet on an 18-inch vein—the Homeward Bound is idle at this time. The Illinois is the extension of the Wisconsin.

The Pennsylvania.

This mine, John Eddie, superintendent, is near the W. Y. O. D. The superintendent is developing the mine. The shaft is now down 400 feet on a vein that runs from 6 to 18 inches. At this time there is but a hoist on the mine. Once the vein is satisfactorily developed, a mill will be erected. "First the mine, then the mill."

The Peabody.

E. Tilley is superintendent of this mine. It is the property of the Nevada Development and Improvement Co. The new three-compartment shaft is now down 300 feet on the vein, which is 50 feet below the old workings. Stations have been put in and drifts run north 40 feet and south 25, from the bottom of the shaft. At this point the vein is 18 inches wide—the ore is here very high in grade—the last test running \$100 to the ton.

The old hoist is utilized to pump out the water of the mine. In the old workings the vein was drifted on for a distance of 700 feet. The ore throughout averaged \$25 a ton. The present shoot in the new shaft exceeds the one in the old workings by \$75 a ton. The company will continue sinking and drive levels ahead 100 feet.

The Coe.

W. Floyd, formerly of Amador county, is superintendent. The shaft is now down 500 feet. Drifts are being run east and west to cut shoots of good ore that crop on the surface. At the same time the shaft is being repaired. The vein in the Coe runs from two to five feet.

Pittsburg.

John White is superintendent of the Pittsburg. The shaft is down 1000 feet and a very complete 10-stamp mill erected on the mine. The superintendent is working to find the vein beyond the point where it was lost on the 300-foot level. In driving, a crossing was encountered which threw the vein west, but the drift was continued in a direct line and the vein lost. Mr. White will croset west and expects to cut the vein in 10 feet. The mine has been a large producer in her former history. If Mr. White can renew her youth and make the mine what it was under him in years gone by, his fortune is made.

The Union Hill.

Mr. E. A. Wiltsee is superintendent of the mine. It is $1\frac{1}{2}$ miles east of Grass Valley, at the foot of Union Hill. The mine was worked up to 1870 to a depth of 350 feet by shaft. The reputation of the mine is good and there is every reason to believe that, shorn of the old faults and under Mr. Wiltsee's management, the property will prove valuable.

At present a series of shafts are being put

down all along the vein to determine the location, pitch, width and value of the vein before commencing a permanent shaft. This is what should be done on every mine, but the writer has seldom seen it done. Mr. Wiltsee is a Colorado miner and his Colorado methods work in very nicely in this section as well.

The Banner.

M. L. Elliott is superintendent of this claim. The 10 stamp mill is running on ore from the 200, 300 and 400-foot levels. The vein is now 15 inches to 10 feet in width, with an average of two feet of ore that mills \$25 a ton. The quartz carries $\frac{1}{2}$ per cent of sulphurets of \$135 a ton value. The best indication of the mine's value is the regular dividend of \$5000 every six weeks.

The Standard.

John Skews is superintendent of the Standard. The mine is $2\frac{1}{2}$ miles northeast of Grass Valley. The property is opened by a tunnel 250 feet long, that shows up an 18-inch vein of \$20 ore carrying in addition three per cent of \$150 a ton sulphurets. Mr. Skews will drive a lower tunnel and then sink on the vein. If Mr. Skews don't make the Standard the equal of his old mine, the Banner, it will be simply because it can't be done.

Wyoming.

S. B. Fowler is superintendent. The mine is in South Grass Valley adjoining the Boston on the south and the Lawrence on the north. In the earlier workings of the mine, the ore milled \$25 to \$112 a ton. The present owners erected a hoist and had a shaft put down 60 feet, when it was discovered that the vein was pitching in one way and the shaft in another direction; as this was not likely to prove up the character of the vein, they have shot down until the hoist can be swung around and a shaft started on the vein as she pitches.

Centennial.

This mine, A. W. Stoddard, superintendent, is two miles south of Grass Valley, on Osborne Hill, at an elevation of 3100 feet. The company is erecting a hoist and five-stamp mill, and cleaning out the old works. The vein in the old workings is from 12 to 18 inches in width of ore that is said to have milled \$50 to the ton.

Reopening Old Mines.

A large number of the old mines of the section are being reopened, and in every case the prospects so far are very flattering. Capitalists have found Grass Valley a good camp to stay by, and the man that has the "sand and soap" to go down 1500 feet on any gold-bearing vein in this section can rest assured that he will be handsomely repaid for his outlay. As in the past, so now Grass Valley still retains her supremacy as the leading gold-quartz mining district of the State.

E. H. SHAEFFLE.

No Forests, No Irrigation.

EDITORS PRESS:—Closely connected with irrigation is forestry, a forest system for maintaining the integrity of the watersheds.

There are two aspects of this question both dovetailing together: 1st. The protection of perennial springs and streams. 2d. The protection of reservoirs from silt and detritus.

It is well established that the delivery of a given rainfall is slow and perennial or rapid and deluvial in proportion as the watershed is tree or brush covered. A forest-covered watershed offers innumerable impediments to the rapid flowing off of rains. The snows melt slowly and the evaporation is at a minimum in forested areas. The French forest officers have shown this in a number of experiments, nowhere more clearly than at St. Phalay. At this point there are two mountain watersheds of almost identical area, slope and exposure—the one is forested, the other bare. In the forested watershed, the rainfall is delivered in a clear stream of a perennial type. No serious floods have occurred. In the bare watershed the rainfall flows off in a few hours, carrying sand, boulders and soil, and often doing great damage to roads, bridges and farms in the lowlands. Supposing a given rainfall to be 1,000,000,000 gallons on each of these watersheds in the one case, it is delivered in 90 days, in the other in nine hours. In the one case, with compensating calculations, about 1,000,000 gallons pass a point on the forested stream per hour. In the other case, about 100,000,000 gallons pass per hour from the nonforested stream.

In the forested stream there is practically no detritus, and its channel is permanent and reliable. The unforested stream, when discharging water at all, is always full of mud, sand and stones, its erosive power is enormous, and at every lowering of grade it must dump a part of the load either in its own channel, which thus filled up is liable to change, or upon adjacent lands to their injury and destruction.

In the first report of the State Board of Forestry, a number of instances were collected in California showing the disastrous results upon springs and streams, both in diminishing or destroying their summer flow and increasing their flood power, due to the harruig of the trees and brush on their watershed.

If you take a city garden slope with grass on it and observe the rainfall delivery, and then look at a similar cemented slope, you may perceive in miniature the effect of forests upon watersheds.

Deforestation in such old irrigation countries as Palestine, Persia, South France and North Africa has already destroyed the sources of

water supply over wide areas. No country of them all is more open to similar results than California. Our dry season is longer, our mountains are higher. If we remove our forests in the mountains without due provision for forest maintenance and renewal, we will change the mountain watersheds from a slow and gradual delivery of their rainfall to a quick and disastrous one. The more bare they are made and the more rooflike they become, the more sudden and disastrous must be the delivery of the rainfall. Such sand and stone-charged floods can do only damage. The water that destroys in the flood is subtracted from use in irrigation.

Every one in California, whether interested in irrigation, in town supplies of water or in the preservation of the lowlands from detritus and flood, should unite in pushing and working for an effective national forest system for the safety of the State.

ABBOT KINNEY.

Kinneloa, Aug. 29, 1891.

Fake Mining.

In mining, as in every other department of human industry, says the *Amador Ledger*, there is a class of spurious operators, as well as the genuine searchers after precious metals. It is often very hard, if not impossible at first to distinguish the legitimate from the counterfeiter. The latter frequently have all the characteristics of the honest investors. They spend money freely in underground work, in the erection of surface improvements, and improved machinery for saving gold. In all quartz mining sections there are barren as well as paying ledges. It is an easy thing to find quartz, but it by no means follow that all quartz, even in a gold-bearing section, carries gold in paying quantities. Nature in the formation of gold has worked by an inscrutable rule. In one point she piles up her treasures in abundance, and a few feet away the same vein may be comparatively barren. This very uncertainty in gold-mining is after all an essential element in keeping gold in its royal place at the head of precious metals.

It sometimes happens that a company is organized to search for precious metal from the best of motives, and enters upon the work of active mining in the proper spirit. After a while the prospecting perhaps does not come up to expectations, and the next thing in order is to get out of the speculation without loss, or may be make a profitable enterprise out of it, in spite of the non-productive character of the claim. Then a raid is inaugurated upon the public by means of stock gambling. The stock of the worthless scheme is thrown upon the market, and every method known to the shrewd operator is resorted to in order to boom the shares. Meantime improvements continue to be made at the mine on a magnificent scale for the sole purpose of deceiving the public as to the value of the property. A mill is erected and started on ore that is known to fall below the paying standard. The utmost secrecy, however, is enjoined upon all employees, and over the door one is apt to read the words "No admittance." Reports of big yields are sent out, but no one outside of those actually concerned in cleaning up and retorting the hullion, is able to tell the actual product. Everything is kept in the dark. The gold is not sent below by the ordinary means, probably from fear that the poverty of that concern might leak out. A dividend is declared, the money for which is supplied by the insiders for the object of working off the stock upon a gullible public. In this way the projectors are enabled to feed out the worthless shares at fat prices, and so not only get out of the scheme without loss, but actually make a profit. When they have let go in this manner, the bubble bursts, and the swindle is exposed, and too often a rich mineral section is made to suffer in the estimation of capitalists by these rascally operations.

The *Ledger* has always held it to be a duty to discontinue all schemes looking to the operation of mines by means of stock-jobbing. In nine cases out of ten they end in disaster, and the recoil is harmful to the all-important industry of this county. The honest investment of capital in the search for gold will always be encouraged, but wild-cat ventures organized for preying upon the pockets of the over-credulous in San Francisco, New York and other centers should be frowned upon. They may make things lively for a time, but when the collapse comes, as it generally does, the reaction more than neutralizes the direct effect of the injudicious expenditure of money in such concerns.

INCREASED VALUATION.—The State Board of Equalization has largely increased the assessed valuation of real and personal property in several of the counties. The increase in San Francisco is \$98,308,559; in Los Angeles \$13,201,813. San Francisco's assessment has been increased 30 per cent. Los Angeles and San Bernardino county have been raised 15 per cent; Santa Clara, 3; San Mateo, Orange and Santa Barbara have had ten per cent added, and Kern and San Joaquin 5 per cent. Without any increase by the board the State rate would have been 48 cents 8 mills on each \$100 valuation, or \$4.88 on each \$1000. With the increases made by the board the State rate will be 44 cents 6 mills on each \$100, or \$4.46 on each \$1000.

THE adjourned annual meeting of the Anti-Debris Association took place at Marysville, Saturday Sept. 12.

Placer Mining in Alaska.

The following extracts from a letter of Mr. McGrath of the Yukon river boundary survey party, will be of interest to miners:

"The most important, indeed, almost the only industry in this country is mining, but it is hard to arrive at any satisfactory conclusion as to the real value of the country for mining purposes. Men have run about in all directions prospecting, but have found no good permanent washings except those on Forty-mile creek. On the Stewart river, I believe that \$100 a day per man has been taken out on one of the bars, but now all the miners have deserted that stream and the only work there is done by Mayo with a steam pump operated by his boat, the New Racket. This pump is the first one ever brought into the country, and we have not yet heard what results have been obtained. On every stream in this region, "color" can be found, but unless a man can make \$4 or \$5 a day on a bar from the first, he must leave it to go on to another place to try for better luck. The cost of living is very high in this country and the working days are few, so that a miner must get good wages to enable him to pay his expenses. In a fairly good season a miner working for another wants \$8 per day as wages, and I doubt if even on these terms any man has ever made much of a stake after a season's work. The country is very wet, and when the creeks rise, the ordinary workable bars are flooded; water-wheels, flumes and ditches are swept away, and time and again it happens that a miner gets his preparatory work finished only to have it all carried away by a sudden freshet.

"Not having the command of any considerable capital, the miners cannot put in extensive works, and thus many of their improvements are destroyed because they are not substantially constructed. Even on Forty-mile creek, however, no fortune has been made, and a man who gets out with a couple of thousand dollars is not to be met with every day. Some miners have lost all faith, and tell us that the creek is worked out, and that when a little more cleaning up is done, there won't be a living in it for a Chinaman. Another man will come down the river and report that many men are doing well, and that the creek has been hardly skimmed over. About the end of July, 1890, some miners came down with most disheartening reports. They said that the men were on short rations and had almost all been standing about idle on account of the flooded state of the river; that last year was unusually bad, and the little money some possessed had to be paid out for living. They themselves had prospected around and finding no good place to work, had decided to leave while they could; most of the men would have to go down the river to get enough food to keep them alive, or use the remainder of their provisions in reaching the coast over the Chilkoot trail. Well, this story turned out almost entirely wrong. All the miners except four stayed in; the creek got low, and by the time that Trader McQueen reached his store, on Aug. 20th, it was estimated that there was not half a dozen men on the creek who couldn't pay cash for their year's supplies. Nuggets were plentiful, one worth \$55 having been taken out during the summer. One party of four men were getting out two ounces of gold per man per day, and had a bar that would last them until the next summer. On the first day after McQueen opened his store he took in \$4000 in cash, and the whole camp was joyful. I suppose that 1890 will be a red-letter year on the creek.

"From what I have said you will gather that mining is rather hazardous here, but I still think that the industry will attain great importance in this region. Personally, I should not care to come here to mine, but then I should not care to take the risks that any practical miner is ready and accustomed to take. I should think that a strong company that could put in good machinery, and could afford to do a great deal of preparatory work, would make money on many of these streams, but when McQueen and Mayo get their steam pump to work on some of the bars, they will probably be able to show results which will determine the matter in one direction or the other."

Sheep Mountain.

V. E. Helsner and Jack Dowling came from Sheep Mountain, in Custer county, on Saturday last, bringing many specimens of ore, the principal of which was from the Rufus mine, in which John Early, of this city, holds a large interest. This mine is well developed and ore from it has been tested in this city during this week that goes \$1,200 to the ton in silver. This is said by the gentleman who brought it to the city to be an average, but of course he is enthusiastic. The owners have without doubt a very rich mine. Some two years ago Mr. Early sent a pack train to this same locality and brought in a quantity of ore. The Rufus is said to be 30 feet wide, and has gangue rock paying all the way between walls. The district is in a very high altitude, where silver is generally most abundant. There have already been two snow storms in the surrounding mountains since the 15th of July. Thirty-six mules had just been loaded with ore to take to Ketobum for treatment before Mr. Helsner left. Two pack trains take ore from this mine to Ketchikan each week. One is owned by Frank Turner, the other by "Kosent," both of whom

are well known in Boise. While Mr. Helsner was gone he made three locations adjoining or near the Mountain King, and has great hopes that they will prove to be good mines when fully developed. Specimens he has in his possession and represents as having been taken from his prospects, are first-class in their appearance.—*Idaho Statesman.*

State Weather Service.

We were pleased to commend earnestly the effort for the establishment of a State Weather Service by the last Legislature. It was shown that Serg't Barwick was ready to direct such a service without compensation, and the United States Government would furnish the blanks and franked envelopes for the transmission of reports, and that in fact the State could have the service at a very little expenditure for work and printing. The Legislature seemed, however, to have something more profitable in mind than weather studies and declined to provide for the service. This did not discourage Serg't Barwick—in fact we have yet to see what will discourage him. He arranged a crop report service under the auspices of the Agricultural Society, and now comes along the State Weather Service by way of Washington.

Our readers know, of course, that the Weather Service is now a part of the Department of Agriculture, not of war.

The chief of the new service is Prof. Mark Harrington, and he has provided a State Service for California, and appointed Serg't Barwick director thereof, with the title of Weather Bureau Director, and with headquarters at Sacramento. There are some 50 voluntary observers who have been for years past sending their reports direct to the Chief Office at Washington. They have been instructed to hereafter forward their reports to Mr. Barwick.

We are authorized to announce that any one in any county who desires to help the Director of the State Service to make this service equal to the best in the Union, and who will apply to Serg't Barwick at Sacramento, will be furnished with blanks and franked envelopes for sending their reports. Those who have no instruments can become crop correspondents, reporting the conditions, etc., of crops at the end of each month and the effects the weather has had upon all growing crops. Of course any person in the State who has his own instruments and would like to have his records published can do so by sending them to Serg't Barwick, who will send them forms and envelopes and a book of instructions.

In places that are 50 miles from points where observations are taken, observers will be furnished with a set of instruments consisting of one maximum, one minimum thermometer and one rain gauge and measuring sticks, by giving a personal bond for the proper care of the instruments that may be placed in their possession.

The Weather Bureau will also endeavor to distribute more widely than has been possible heretofore, weather forecasts, rain warnings, etc., and to collect and publish climatological data which shall be of value to the several States and Territories. Any towns or villages desiring the forecasts sent them by telegraph free of cost can have them either by telegraph or telephone, providing they will pay a set of flags, four in number, and hoist them as would be designated by the weather forecasts as sent out from San Francisco by Lieut. Finley, the forecast officer. Parties can learn more in regard to this matter by addressing either Lieut. Finley, at San Francisco, or Serg't Barwick at Sacramento.

The foregoing gives an outline of the movement to extend the weather service and to render its work more directly valuable to the people. We trust this will attract the attention of our readers and win their co-operation. We have made wonderful progress in this direction during the last few years, and there seems reason to believe that we are but at the beginning of an undertaking of the matters involved, which will be wonderfully satisfactory and practically profitable.

IT PUCKERED UP.—The following story of unsuccessful prospecting is told in the *Geneva Courier* on R. H. Galatt, the well-known stage proprietor of Douglas county: "Do you see that white spot on the hill yonder?" said the Judge. "Well, that's Dick Galatt's alum mine. When Dick drove stage here he used to tell the passengers this story: 'You see, I'd struck the genuine Boulder Hill ledge and had run a tunnel about 40 feet, when about sundown we struck an immense body of alum. We quit work, and the next morning when we got ready to work, I'll be blown if we could find a trace of the tunnel or ledge.' 'Why, what became of it?' asks the unsuspecting tourist. 'Well, you see there was a heavy rain that night and the whole thing puckered up.'"

It has been decided to have the Machinery Annex at the World's Fair, an annex in fact instead of being an isolated structure as at first planned. The annex will adjoin Machinery Hall on the west. The entire structure will thus measure 500 by 1400 feet, and be second in size only to the Manufacturers Building, the dimensions of which are 788 by 1688 feet. With its galleries, the latter building will have 40 acres of floor space.

Pigs Found the Copper.

The Scientists Knew It Could Not Be There, but Nevertheless It Was.

"How was the Calumet and Hecla discovered? you ask. Here, Captain Donnan, you tell this man what he wants to know."

These appealed to, the broad-shouldered, smiling-faced man whose spirit pervaded the great copper mine stepped up to the little group waiting for dinner in the hotel at Osmet.

"It was pigs," he said.

"Yes, it was pigs," echoed the group.

"Pigs!" I exclaimed incredulously.

"Pigs, and no mistakes," remarked the captain. "Back in 1863 an exploring party came here to try and find copper. They built a shanty to live in, and of course they brought some pigs. One night the pigs were lost. The boarding-house keeper started out to find them. After a long search, he heard the pigs rooting and squealing, but he could not see them.

"The noises seemed to come from down in the earth. Next morning, a party of men went back to the place whence the noises came, and after a search, they found a pit 10 or 15 feet deep. The month was covered with bushes, and the growth of the trees about the sides gave evidence that it had not been used for centuries. There the pigs were contentedly rooting among the broken pieces of rock.

"A rude stone hammer and some charred sticks gave evidence of earlier explorers who had evidently gone away unsuccessful. The hammer was of the same kind as the other implements, which had been traced back to the days of the predecessors of the Indians whom the French found in possession of the lands—the Indians who built the mounds, and who overran the whole country from Mexico to Lake Superior, where they got copper for their implements and utensils.

The mound-builders, like the explorers who had discovered the ancient pit, looked for copper only in masses, as it had been deposited in fissure veins and in the lava flows. The huge chunks of virgin copper weighing many tons, and the smaller masses hanging in the rocks like metal icicles, were the only kind known to the ancients, and the moderns had been assured by the learned geologists that copper could be found only in rocks formed from lava.

"But the pigs had turned over pieces of rock formed by the action of water—aqueous rock—and in these conglomerates there certainly was copper. This seemed a find indeed. But when the matter was reported, science scoffed at the explorer, saying that the copper conglomerates found were simply a freak of nature, and that money would be wasted if an attempt were made to work them.

"So Mr. Haribart, who owned the lands, continued to give his attention to the Huron mine, which was working the lava flows. For the money he borrowed for the Huron, he gave to Quincy Shaw of Boston the lands on which the conglomerates were found. Mr. Shaw soon began to work these rocks, and from these beginnings, the richest, most stable and the best promising copper mine in the world has been built up."—*Detroit Tribune.*

How Gold is Shipped.

As few people realize the vast bulk of gold coin that is shipped annually from one country to another, and are unacquainted with the manner of shipment, the following from the *American Banker* will be interesting:

The Bank of America is the largest single shipper of gold from New York, and indeed from the United States. Shipments are made in stout kegs, very much like the ordinary beer keg. Every one contains \$50,000 in coin or bar gold. The latter is the favorite of these shippers, since the Government has permitted the Sub-Treasury to exchange coin for bar gold, as coin, in a single million shipment, is liable to loss by abrasion of from 8 to 20 ounces, or from \$128, to \$320; while the bars only lose about three-fourths of that value. Where coin is sent, double eagles are preferred. They are put in stout canvas bags, each containing 250 double eagles, or \$5000, and ten bags fill each keg. About the only precaution taken against tampering with kegs is a treatment of kegs' ends technically known as "red taping." Four holes are bored at equal intervals in the projecting rim of the staves above the head. Red tape is run through these, crossing on the keg's head, the ends meeting at the center, where they are sealed to the head by the bardest wax and stamped with the consignor's name. The average insurance is about \$1500 per \$1,000,000. There is an expense of about \$2 per keg for packing and cartage aboard ship, or \$200 for the same sum and the inevitable loss by abrasion, whatever it may prove to be. The great Wall street firms ship from \$25,000,000 to \$40,000,000 annually. Some of these have for years insured themselves, and assert that the saving has been sufficient to replace a loss of \$1,000,000. These are large figures, but this has become a country of large figures and affairs.

The loss by abrasion on every \$1,000,000 in gold coin shipped across the Atlantic is said to be between one and two thousand dollars.

JOHN COLEMAN, Supt. of the Ruby mine, near Forest City, Sierra Co., was shot and killed on the evening of Sept. 3rd by John St. Pierre, the watchman at the mine. The flames at the mine have been robbed several

times recently and Coleman censured the night watchman for negligence of his duties. St. Pierre felt aggrieved and murdered Coleman.

Electricity and Industry.

In the census taken ten years ago, a department was devoted to the subject of power used in manufacturing, but its reports and tables dealt only with steam and water power and made no mention of electricity. During the ten years that have intervened the application of electricity to industrial purposes has been wonderfully rapid. About two years ago, *Electric Power*, a New York journal, printed a list of 150 industries to which the electric motor had actually been applied in this country, and one of the editors expresses the opinion that if a list were now prepared with equal completeness, it would show that the electric motor has found employment in connection with nearly 300 branches of productive industry. The electric motor has been successfully used to run the sewing machines of girls employed in glove-making in their own homes, and with the reported result of enabling each worker to accomplish more and better work in less time, and under conditions more favorable to health and causing less fatigue.

With these facts before us, the introduction of electricity as a power applicable to a great variety of industries, and available in the private home and at the individual work-bench, is no longer a dream or a prophecy, but an actual realization, of which the possible future development and industrial influences cannot be foretold. One of the principle articles of belief of the cheerful economic creed so aptly propagated by Mr. Edward Atkinson is that natural forces are constantly tending to a distribution of population more favorable to individual welfare. That where men have been too much isolated on great farms and sparsely settled tracts of land, the tendency toward higher cultivation of smaller areas is operating to bring them into closer and better relations with the world, and that, on the other hand, where population has become too closely concentrated, in crowded cities and towns and over-crowded tenements, the development of rapid transit is operating to secure a distribution over a larger area, and to correct the evils incidental to a congestion of population at industrial centers.

In the latter direction, nothing could be more efficacious than the gradual adoption, in many industries and at many manufacturing centers, of a form of power peculiarly suited to such distribution as would do away with the necessity for crowding hundreds of operatives together in the work-rooms of great factories. Such a change could be made to bring with it an amelioration of many of the conditions which now occasion most complaint, and to secure for a great mass of workers more wholesome and cheerful surroundings, less crowded and better lighted and ventilated. Such a change seems like a dream of a return to the days of the hand-loom and spinning wheel, and its possibility is an answer to much of the sentimental lamentation constantly heard about the changes which time and development have wrought in the condition of the toiling masses. Progress in the application of electricity to the employments of men is but one of innumerable evidences that an improvement in social and industrial conditions is to be sought in the higher development of mechanical invention, and in the advancement of science rather than in vain regrets for the simpler life of their irrevocable past.—*New York Commercial Bulletin.*

HOW ONE FEELS WHILE FALLING FROM A GREAT HEIGHT.—A Boicot (Wis.) correspondent of the *Chicago Inter Ocean*, gives the fearful experience of an actor while falling four stories through an elevator shaft in Beloit: Mr. G. W. Sparke, the actor of the East Mall Company who fell four stories through the Goodwin House elevator shaft, will be taken to the Presbyterian Hospital, Chicago. He will survive, and in all probability will not be maimed for life, as was feared. His experience in falling was thrilling. "I opened the door quickly, and rushed into the room, as I before stated, to pack my grip, feeling for a match as I did so. I suddenly realized that I was falling, and inwardly cursed the step, thinking I had slipped off a step. Then I knew I was going down a shaft. I kept striking against something which I thought was boxes. My business has so associated galleries and boxes in my mind that this seemed to flash before my eyes, yet I counted one, two floors, and thought I would land on the third. 'I will save my temples and brain,' I said to myself, 'when I strike, and put my hands and arms to my head.' I was sure I was not going to be killed. When I passed what I thought was the third floor and was yet going down, down, down, an awful sensation came over me, a thousand times more horrible than what I had experienced, and I thought 'mercy! mercy!' I heard my bones crack and I knew I was dreadfully hurt, and thought I would call Mr. Carter, and if he did not hear me I did not know what I would do." Several persons heard me call "mercy."

THE NEW HERRESHOFF STEAM YACHT, built for Mr. W. R. Hearst, of San Francisco, made a trial trip lately at the rate of 24 miles per hour under 200 lbs. of steam. She is licensed to carry 260 tons, and is guaranteed to make 25 miles per hour. The yacht is 110 feet long, 12 1/2 feet beam, and 5 1/2 feet draught. She has an 800 H. P. quadruple expansion engine, and tubular boiler of the Thornycroft type.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

KENNEDY.—*Ledger*, Sept. 12: The last monthly dividend paid by this company was 30 cents per share, against 40 cents for the previous month. The reduction was owing to running through a larger quantity of the lower grade ore. The cleanup amounted to over \$40,000 without sulphurets.

NEWTON COPPER MINE.—J. A. Ferson, who is largely interested in this property, was in Jackson this week with a capitalist from San Francisco. There is a movement on foot looking to the building of a smelter at this mine. It is claimed that the ore is better for smelting purposes than that at Copperopolis, and the indications are that the ore body is equally as large. The Copperopolis mine gives employment to 150 men, and it is believed that with 100 men the metal output of the Newton would equal the Calaveras mine. No underground work has been done on it for years, and the introduction of the smelting process would give an immense impetus to business, and lead to the building up of a town at Newtonville.

Calaveras.

MINE BONDED.—*Mt. Echo*, Sept. 10: The Thorpe mine, situated in the South Calaveras mining district, and about midway between Angels and San Andreas, has been bonded to the Utica Gold M. Co. Operations have been commenced on the property and it will not be long before the mine will be in excellent working order. This is without doubt a good mine, and under the management of this company we look for big results.

MINING IMPROVEMENTS.—Quite a large force of men are employed in digging a ditch along Bush street from the Utica mine to the Lane & Tulloch mine in the southern part of this town. As soon as the ditch is completed a 20-inch iron pipe will be laid in it to convey water to the latter mentioned mine. This is an extensive as well as expensive undertaking, but it is evident from what is being done that the company has faith in the Lane and Tulloch property.

EXTENSIVE IMPROVEMENTS are being made on different mines in this vicinity at present and an immense amount of money will be expended in putting mining properties in condition for operating on an extensive scale. That the mines are here there is no doubt and no better evidence need be offered than the fact that the long-talked-of mother lode courses through this town, and also that the Angels, Utica, Stickle and Marshall mines are located on it. At a depth of 600 feet the vein is hundred feet and over in width, all good milling ore, carrying sulphurets of a high grade. Such a town is Angels at present and its outlook for the future is better than any place we know of.

El Dorado.

PACIFIC.—*El Dorado Republican*, Sept. 10: The Pacific Co. have had a force of men engaged for some weeks in cleaning out the shaft on the Harmon mine and have sunk it 12 feet deeper. They uncovered some very fine rock about a week ago.

SEAM MINING.—*Georgetown Courier*, Sept. 10: James Davis has purchased of E. C. Cheek his seam claim adjoining the Crane's Gulch mine. The old pioneer knows the mine well, and believes he can work it to good advantage. The shaft on the Darling reached a depth of 100 feet last Monday. The excessive flow of water has necessitated the putting in of a larger pump. The ledge holds its size and the ore its richness. Considerable preparations are going on among miners to open up, develop and work new as well as old claims, and everything portends a revival in mining. The season just closing has been unusually quiet, but it is now apparent that people generally are waking up to the necessity of working our mines in a more thorough and systematic way.

DRIFT.—There are some valuable drift mines on the Middle Fork of the Middle Fork below Ralston's which are being steadily worked. Among the mines which are being successfully worked are six claims as follows: Mike Corcoran, Oscar Vaughn & Co., Job Pierce & Co., Marshall & Wright, Baxter & Co., Mike Bagan. The gravel mines at Volcanoville are also being developed, and some of them producing handsomely.

Mono.

JORDAN DISTRICT.—*Bridgeport Chronicle-Union*, Sept. 12: The combination tunnel of the Goleta, Montecito and Sterling mines in the Jordan district is being pushed ahead energetically, and the indications are good for the ledge being within easy running distance, and liable to be cut within a very short time. The tunnel is in 850 feet. The work of getting out ore from the Dunderburg mine, near Bridgeport, is progressing. Several tons will be shipped to be worked by mill process. A. F. Bryane, who left for San Francisco on Monday, took two sacks of ore from the two drifts for a sample working.

BODIE.—Supervisors have been surveying the disputed ground of the Bulwer-Standard, containing the rich strike reported a short time since. For the good of Bodie and the county generally, it is to be hoped that the two companies will settle the disputed points without a resort to the courts again.

LUNDY.—The Lakeview mine at Lundy is looking fine, and a recent working of a few tons of ore paid splendidly. The new 10-stamp mill will be pushed to completion as fast as possible.

Nevada.

THE FEDERAL LOAN.—*Transcript*, Sept. 7: Last week a clean-up of 189 ounces of gold worth nearly \$3000 was made at the Federal Loan after four weeks' run with five stamps. This did not include the gold from the sulphurets, of which the company has about 35 tons on hand. The gold cleaned up exceeds by about \$700 all the expenses of extracting and milling, also the cost for the month in sinking the shaft and driving the drain tunnel. The ore crushed came from the 150 and 300 levels. Yesterday a splendid looking ledge a foot and a half thick was struck in the shaft. The Federal Loan has a bright outlook.

RICH STRIKE.—*Grass Valley Telegraph*, Sept. 7: There has been a large and very rich ledge unearthed in the Coe mine. The ledge is full of coarse gold and is heavily sulphuretted. The new ledge was

found in the east drift about 130 feet from the shaft and is about 3½ feet in thickness. The strike is very encouraging and creates much talk among mining men.

SHOULD BE WORKED.—*Grass Valley Telegraph*, Sept. 10: The Dromedary mine, just within the town corporate limits on Wolf creek, lies practically idle. Such should not be the case, for the Dromedary in years gone by yielded most handsomely. For the past three years this mine has been more or less developed by the Berriman Consolidated Gold M. Co. The development work consists of a new two-compartment shaft 60 feet in depth. Rock extracted from the shaft yielded an average of \$40 per ton, and some fine specimens were also taken out. Grass Valley has more than double as many mines idle as are working and which surely would pay. Such we believe will not always be the case.

MINING ON THE YUBA.—*Grass Valley Union*, Sept. 9: The mining operations on the South Yuba river, being carried on by Bourne, Pollard & Co., have been interrupted by finding that the ground uncovered is not over the old river channel, which is nearer the south bank. This will require a change in the line of the wing dam, and a shifting of the position of the pump, which will require several weeks' time. The edge of the pay gravel has been encountered, which prospecting at the rate of 50 cents to the pan, but it could not be worked into, as, being under the foundation of the pump and the site of the wing dam, there was danger of striking a strong flow of water that could not be controlled. It is getting late in the season to make the necessary changes in the plans of working, but some of the company believe that this can be done, and sufficient time left to have a few weeks to work in the gravel channel. There is no doubt felt but what the ground will yield richly now that the pay channel has been definitely located.

A GREAT BED OF KAOLIN.—*Grass Valley Union*, Sept. 16: John H. Nichols, who has been prospecting during the past season at Pine mountain, on Lower Wolf creek, in quartz, has found a bed of kaolin which is over 100 feet in depth. Not much prospecting has been done in it, but sufficient to show that it is largely free from impurities, while a portion of it is mixed with sand. The signs indicate that the clay is 100 acres in extent. In one part a quartz vein is found of low-grade quartz, but as large size it is believed will make it profitable for working, as it has been penetrated seven feet and not cut through. A peculiarity of this vein, as far as prospected, is that it has no inclosing walls of country rock, but is closed in on both sides with kaolin. It is contemplated to put up a battery this winter to prospect the quartz vein. The statement that has been published that it is the intention to establish a pottery on the ground to work the kaolin is not correct, the plan in present contemplation being to establish the pottery in Grass Valley and haul the clay here, the distance being ten miles. But the plan is as yet indefinite and has not assumed form, and no immediate working of the kaolin bed is contemplated.

TELEGRAPH MINE.—The steam hoisting works of the Telegraph mine will be ready to start up today. The incline shaft on the vein, which has been in the course of sinking for some time, has reached a depth of a little over 100 feet. A small vein of quartz has been in the incline all the way, and the quality of the rock is good. Not much water is coming in, but with the aid of the steam machinery, no trouble will be experienced from water in the future sinking of the shaft. The Telegraph is on the same vein as the W. Y. O. D., and the prospects up to the present time are considered very encouraging.

IMPORTANT STRIKE.—*Transcript*, Sept. 14: One of the most important developments that has been made here in years is that in the Nevada City mine. When the present company came into possession of the property, it concluded to commence operations some distance from the old workings, on account of the delay attending the pumping out of the old shaft. It commenced operations in a systematic manner, and the mine has been worked without a very large expenditure of money outside of what it has yielded. They have a splendid looking ledge on the 300 level, and the striking of the same ledge of a larger size and richer in quality on the 400 has demonstrated that they have a very valuable property outside of the old workings which is known to contain an endless quantity of good ore. Every indication points to the fact that the ledge on the 400 will be found on the 500, and how much deeper no one can tell.

NORTH BANNER MINE.—*Grass Valley Union*, Sept. 12: Some delay has been occasioned in putting in an additional pump in the North Banner shaft because of necessary castings not being ready, but now everything is in order. In the meanwhile the pump heretofore in use has been holding the water below the 400 level, and the stopping of ore from that and the levels above has been going on regularly, although the sinking of the shaft had to be temporarily suspended. The vein in the shaft is strong and the ore of high grade. Notwithstanding the interruption of work on account of striking a strong flow of water, the mine will give about its usual yield for the month.

CALIFORNIA MINE.—*Grass Valley Telegraph*, Sept. 10: The hoisting and pumping machinery are now about ready to start at the California mine, and Mr. W. S. May has done a good piece of work with the building and in placing the machinery. It is expected that on Monday next, steam will be started at the mine and then the work of sinking the shaft to a greater depth will be commenced. The building of the mill will be immediately begun, and by the 10th of November the new mill will be at work on rock from the mine.

Napa.

THE BLACK BEAR MINE.—*Calistogian*, Sept. 9: Road-making, getting out timber, and other preliminary work necessary for the beginning of labor in the Black Bear quicksilver mine, Pine Flat district, has been going on for some time past, and operations underground will soon begin. It will be remembered, at least by some of our readers, that all the workings in this mine have been caved. The shaft, through which it was intended to work the mine the past few months, caved in last winter. An old tunnel, 250 feet in length, is caved more or less, and was so before the present owners took possession. This tunnel is to be reopened, and its condition may be such, that much of the coming winter will be required to complete the work. When fin-

ished, no time will be lost in taking out cinnabar. It is there, but the trouble has been to get an opening through which the ore can be brought to the surface.

THE PALISADE.—We understand that the reduction works at the Palisade mine will not continue in operation much longer before being shut down. Work in the mine will be continued, however, particularly in the shaft in King canyon, where the hoisting works are located. This is to be sunk deeper, and a new level opened. Another run of the reduction works is not contemplated until after this work is completed. It appears that the company has decided not to work low-grade (\$10 or \$12-ore) as was the case during several months, when the reduction works were first operated. Only high-grade ore receives, or will hereafter receive attention.

San Bernardino.

CALICO.—*Cor. San Bernardino Times-Index*, Sept. 11: The Waterloo M. Co. have built a branch from their main motor railroad to Calico, and are transporting 100 tons per day of silver ore from the Silver King mine. This, together with what they are shipping from the Waterloo mine, makes a daily output of about 150 tons, which keeps their 75 stamps busy. Emil Sanger, Supt. and manager of this company, has just returned from quite an extended trip in the East. The Silver King M. & M. Co. are running their 20 stamps steady with ore extracted from their various mines in Calico. This company has resumed work on the Silver Odessa mine, with Wallace Corbett as foreman. Some very rich ore has been taken out of this mine lately by chloriders. At the Bismark and Humburg mine, chloriders have sunk through what was generally considered the bedrock in this part of Calico, namely, sandstone, and at both mines have struck some very rich ore. J. B. Stebbins is making preparations to erect a five-stamp mill in the place of the Barber mill, which was burned to the ground a few months ago. The Alvord mine, near Camp Cady, is doing steady work, and from latest reports is looking well.

San Diego.

TIN ORE.—*San Diego*, Sept. 10: Warner Wheatley has discovered a tin mine in San Diego county. The mine is located 65 miles from this city and somewhere "within sight of Salton lake," but that does not say exactly where. Some time ago Mr. Wheatley brought in some sample ore from the mine and showed it to Dr. Eames. The Doctor liked the looks of it and sent some of the ore to New York to be reduced and analyzed. The result was handsome. The analysis showed the sample to be 56.25 pure tin, an almost marvelous percentage when compared with the Cornwall mines, which show but 1.4 per cent tin, and good when compared with Temescal tin, which the richest ore shows but 65 per cent and the average is 15 per cent. Dr. Eames' son will in a few days go out to look at the extent of the deposit.

SOME RICH STRIKES.—*Julian Sentinel*, Sept. 10: The past week has been a red-letter one with our miners, and among our mines all along the line from Julian to Banner, there is the echo of new finds. The first to open the hall was the Cincinnati Belle, with a wide ledge of magnificent ore and no end of it yet in sight. Then the Helvetia people received a reward for their patience and faith by opening up a ledge of the most promising ore seen in the camp for many a day. A report has it that the vein as found is two feet wide and still increasing, some of the rock being so heavily flaked with gold as to make it possible to work it up into jewelry. The Ruby mine has passed into the hands of a well organized company, of whom there are several San Francisco men of capital. The company will be known as the Ruby Mining and Milling Co., and this fine property will be pushed now with unremitting energy. The boys at the Warlock have a splendid vein in sight. There is pay rock nearly four feet in width. The ore will average \$50 to the ton at the lowest figure, and the three who have the mine under lease are taking out each a ton a day. Fifty dollars a day to the man is not had for wages. They have 40 tons of ore on the dump that will soon be put through the Banner mill.

Siskiyou

BLUE GRAVEL.—*Yreka Journal*, Sept. 9: Lee, Lash & Co. are going down deeper with their shaft and drifting at the Greenhorn blue gravel mine, so as to make sure of draining the lowest portion of the pay channel, a very good precaution, as it may save making a deeper drift afterward. As soon as the drift is extended to the pay channel near the new shaft, they will again commence taking out rich pay in good quantity. The shaft of the Yreka blue gravel mine on the east side of Yreka creek, is now down about 100 feet, with gravel of same nature as during past two or three weeks, being of a heavy cement-like character similar to the Greenhorn blue gravel mine. The miners seem to feel confident that they are nearing bedrock, where good pay will no doubt be realized. The hydraulic and placer miners are commencing to fix up for winter work, so as to be well prepared for active operations when the winter storms commence again. The river miners along the Klamath are taking out pay gravel with good success lately and will continue to do so still better until the cold weather and winter storms interfere.

Tulare.

BALD MOUNTAIN.—*Porterville Enterprise*, Sept. 11: Many years ago D. B. James located in the little town of Tail Holt, and being something of a mineralogist, discovered that the neighborhood abounded in the precious metal, though in what quantities he was unable to determine. He delved and dug, and made so successful an examination that he erected a 9000 stamping mill of 10-stamp capacity. He opened mine after mine and took out thousands of dollars; but alas, he lost all he made in other ventures of chimerical aspect. Some months ago Mr. James disposed of his interest in all these mines to an English syndicate represented by Mr. Percy A. Thomas, a young gentleman of large experience and considerable foresight. Mr. Thomas experted the property, pronounced it satisfactory, and when an *Enterprise* representative paid a visit to that gentleman a couple of weeks back he found the stamping mill crushing free-milling ore, the Bald Mountain, Eclipse, Mammoth and Keyes mines in full blast. The Bald Mountain mine is situated 2½ miles from Tail Holt in a southeasterly or easterly direction and is the principal mine in the district. At the present writing a tunnel has been bored to

the extent of about 700 feet, while a shaft which is being sunk to admit air to said tunnel is down about 125 feet. Some very fine ore is being taken out, seven tons of which two weeks ago turned out about \$115 worth of the raw metal, averaging about \$16.45 per ton. It is the intention of the company, if everything turns out as satisfactorily as they expect, to develop this mine fully. They will put in more stamping power and batteries, construct a system of wire tramways between the mines and the mill, and otherwise rush things.

NEVADA.

Washoe District.

CON. CAL. & VA. MINE.—*Virginia Chronicle*, Sept. 12: 1100—Have continued retimbering south drift. The crosscut running east from the shaft station has been extended 40 feet; total length, 97 feet, in porphyry and clay with some quartz showing low value. Have continued to extract some ore from the openings on the 1300, 1500 and 1600 levels.

1650 level.—Have continued to extract ore of fair quality from the drift run west from the top of the upraise carried up 59 feet above the southwest drift. Ore of fair quality has been extracted through the drift run east from the winze No. 3 (down 73 feet) in working upward from that point.

1750 level.—In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to strike ore of fair quality. There has been extracted from all parts of the mine during the week 1018-30 2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all of the ore worked at that mill during the week (980 tons) was \$22.40 per ton. Bullion on hand in assay office, assay value, \$11,000.

OPHIR.—1465 level.—We have extracted and raised to the surface 20 tons of ore, the average assay value of which is about \$22 per ton.

MEXICAN.—On the 1465 level the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift has been advanced 27 feet; total length, 265 feet, in a hard porphyry formation showing clay separations.

UNION CON.—From the east crosscut No. 2 on the 1465 level, at a point 1070 feet from the main north lateral drift, the north drift. No. 2, has been advanced 22 feet; total length, 44 feet, in vein porphyry, which carries a low assay value.

GOULD & CURRY.—200 level.—Main south drift has been advanced 30 feet, through soft porphyry, streaks of clay and quartz. East crosscut No. 2, 65 feet above 200 level, has been extended 15 feet; total 43 feet, face in porphyry and quartz, showing some value. West crosscut, No. 2, opposite east crosscut, has been advanced 15 feet; total, 41 feet. The last eight feet passed through is in quartz showing some value.

BEST & BELCHER.—1100 level.—East crosscut, No. 1, has been advanced 23 feet; total, 80 feet; face in soft porphyry.

EXCHEQUER.—The joint south drift from the 1800 station of the Ward shaft is out 344 feet; the face is in porphyry.

CHOLLAR.—Extracted and sent to the mill the past week 359 tons of ore; average battery assay, \$16.08.

POTOSI.—The north and south lateral drifts from the winze station, 1400 level, are each out 36 feet in porphyry. Are opening a station at the 1500 level of the winze.

WARD COMBINATION SHAFT.—The joint southwest drift from the shaft, 1800 level, is out 344 feet; face in porphyry.

SILVER HILL.—The northwest drift, 50 level, is out from the shaft 250 feet; the face is in quartz and porphyry.

BULLION.—The southwest drift from the Ward shaft, 1800 station, is out 344 feet; the face is in porphyry.

CON. NEW YORK.—The west crosscut, 230 level north of shaft, 650 level, is out 52 feet; face in quartz assaying from \$15 to \$30. The north lateral drift, 1100 level, is out north of shaft 688 feet; face mostly in quartz yielding low assays.

UNION SHAFT.—The west drift from the shaft, 900 level, has a total distance west of shaft of 1060 feet; the face is in clay and porphyry.

UTAH.—The southeast drift has been extended 38 feet; total, 293 feet; being in porphyry, clay and quartz, the formation of low assay value.

SIERRA NEVADA.—The Kenosha tunnel has been advanced 28 feet; total length, 872 feet; the face is in porphyry.

NORTH GOULD & CURRY.—Last Monday we started work at the North Gould & Curry mine through the East B. & B. shaft. There is some water in the shaft, and it will take some time before we can get at the new drift running into the North Gould & Curry ground.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine 304 tons of ore of the average value of \$17.90 a ton. The stopes above the 650 level is showing a better grade of ore, the average assays being \$21.

Tuscarora District.

NAVAJO.—*Times-Review*, Sept. 11: Everything in and about the mine is working nicely, the stopes continue without material change.

NORTH COMMONWEALTH.—Second level.—No. 2 west crosscut extended 11 feet and raise started to open up ore cut by joint raise. Third level.—No. 2 joint raise extended 21 feet, cutting seam of good grade ore. Drift has been started south following the ore.

DEL MONTE.—Joint raise from third level extended 21 feet, cutting a seam of fair-grade ore. No. 1 north drift, same level, advanced 15 feet in the vein. North drift from east crosscut extended 13 feet, and crosscut from end of drift extended 16 feet, still in vein matter.

COMMONWEALTH.—Fourth level.—North drift from the bottom of No. 1 winze has been run 17 feet, face in vein showing some mineral. Raise from east crosscut through vein 33 feet, showing seams and bunches of good ore, assaying \$60 to \$270 per ton. Have started north drift from top of raise.

NORTH BELLE ISLE.—North drift from the south line crosscut, 400 foot level, extended 14 feet, showing some very nice ore which promises further improvement. No. 1 upraise from this drift extended 18 feet, vein larger but not so rich.

BELLE ISLE.—Line crosscut, 350-foot level, extended 20 feet, the rock is looking very favorable for ore. South drift from the same crosscut advanced 11 feet, the vein is growing wider, ore very

rich. North intermediate drift from the winze below the 450-foot level is in 14 feet and showing fine ore. South intermediate, same place, is in 11 feet. Line crosscut, 450 foot level, extended 14 feet, looking very favorable.

Aurora District.

PROSPECTORS.—Walker *Lake Bulletin*, Sept. 2: Mr. J. Huelat from Aurora reports that E. T. Greeley of the Prospectus mine is doing well. He has extracted about 600 tons of good ore, which has been shipped to the Del Monte mill. The mill will start up in a few days and if the ore pays, work will be pushed vigorously in the mine. John Fleming is hauling 300 cords of wood to the mill, and the people who have stayed with the old camp are very hopeful of the future. Five men are working the old Esmeralda, and the prospects are very encouraging. Supt. Scrutton says that he will increase the force if ore of good grade is encountered. Efforts are being made to induce capitalists to take hold of the John Neidy mine. A large body of good ore is known to exist in this mine, which, would, no doubt, yield a big return for money invested.

Montgomery District.

GOLD ORE.—Belmont *Courier*, Aug. 29: Reports from the gold mines situated in the southern part of Nye county are very encouraging. The work of development is being pushed ahead vigorously, and the indications for striking large bodies of good ore are excellent. Speaking of that section of our county, the Carson *Tribune* says: "Surveyor-General Jones received last Thursday a quantity of pay ore from the Chispa mine in Montgomery district. It was discovered by Mr. Montgomery and has been thoroughly prospected. A ledge fully developed, and from 2 to 14 feet wide, contains ore which works from \$18 to \$30 to the ton, and the chances are greatly in favor of finding very much richer ore. A ten-stamp mill is in course of construction and work will be vigorously pushed. The property is in Nye county in the vicinity of Death valley."

Jackrabbit District.

THE DAY MINE.—Pioche *Record*, Sept. 5: What is called the Junction tunnel is now in 130 feet, following the ledge which at this point contains but little ore. The winze sunk on the ore body 70 feet from the mouth of the tunnel is now down about 40 feet and is all in ore which is soft, easily mined and which averages 35 ounces in silver per ton and 40 per cent lead. The work is prosecuted by means of a small compressed air engine which is supplied with power from the compressor at the mouth of the old working tunnel. Exploration work has been resumed on the West Vein, the full extent of which is not yet ascertained, and some rich ore is being taken from it.

ARIZONA.

CUSTOM ORE.—Mohave *Miner*, Sept. 10: Messrs. Eames and Biddell, of the Empire mill, came from California this morning. They will put the mill in order and start up on custom ore right away. The last run of the mill was quite successful and the experiments made then will be of great benefit to the management hereafter.

THE MUSIC MOUNTAIN M. Co. is pushing work on their mine. The shaft has been cleaned of the debris left by careless chloriders, and newly timbered below the 70-foot level. Levels will be started near the bottom and as soon as possible a force of miners will be put on stoping. At present there is barely enough to run the mill one-third of the time, but it is thought that an abundant supply can be obtained by opening up the spring. The mill runs thus far have been very satisfactory, and no difficulty will be experienced in getting sufficient ore to keep it running to its full capacity.

WEAVER.—Del Bebe went out to Weaver district last Sunday. He says that the Edith mine has immense quantities of ore in sight and that a new road is being built to the Colorado river, a distance of eight miles. A 15-stamp mill will be put upon the bank of the river as soon as possible. The ore is all free gold and a 15-stamp mill will crush about 50 tons every 24 hours. Monaghan & Murphy, of the Needles, and Henry Brown, of Weaver, are the lucky owners of the properties.

CHLORIDE.—We learn that a big strike has been made in the Distaff mine at Chloride. A streak of pure black metal has been encountered that will run up in the thousands. The Denver M. & M. Co., who has the property under bond, has found in it one of the bonanzas rarely found in a lifetime.

CLOSING OF THE CONGRESS MILL.—*Journal-Miner*, Sept. 2: Rumors of various sorts have been afloat during the past few days concerning the closing down of the Congress mill, so that the *Journal-Miner* man called on Superintendent Murphy to-day and asked him concerning the truth of such rumors. "Yes," said Mr. Murphy, "I have given orders to close the mill down. The reason for doing so is that the construction of the S. F. & P. & P. railroad is now an assured fact, and, as is well known, the Congress Mining Company is financially fixed so that it is not only not obliged to run its mill, but is assisting financially in the construction of this road. The building of the road means a saving to the company in transportation from \$75,000 to 100,000 per year, an item certainly worth saving. The mine is looking better to-day," continued Mr. Murphy, "than it has at any time since work was commenced on it, and while of necessity the working force will be reduced some, work will be continued in the mine until all facilities at our command for the storage of ore have been exhausted or until the mill starts up again. The freighting outfits have also been reduced, but there are enough concentrates and ore on hand now to keep a few teams employed probably all of next month. We will close the mill with several months' supplies of all kinds on hand, and within six months of the completion of the railroad to the mine, it will be started up again, and the product stored until the road is completed there."

BRITISH COLUMBIA.

THE UPPER COUNTRY.—Nelson *Miner*, Sept. 1: The outlook for the upper country is becoming brighter. Illecillewaet is reported quite lively. Revelstoke is to become a lumbering as well as a smelting center. The snowsheds in the Selkirk are sound and as solid as the day they were put in. Donald is lively. The ore in the Monarch mine at Field is becoming less refractory. The Lanark

mine near Illecillewaet is said to be looking fine, the ore body being over 60 feet in extent and no walls visible. Archie McKinnon has bonded his Maple Leaf for \$50,000, with a cash deposit. The San Juan claim is reported sold at figures close to \$40,000. The Corbin & Kennedy claims on the east fork of the Illecillewaet are being examined by the representatives of an English syndicate, and are quite likely to change hands at a figure said to be \$200,000. Over on Fish creek better days are dawning, even the Dunvegan, is likely to turn out to be a big property. A strike of good galena ore is reported being made by Pete Walker and Tom Downs at a point on the Lardeaux about three miles from Trout Lake.

A FIND MADE ON SALMON RIVER.—Instead of going through to the Priest Lake country in Idaho. Jack Buchanan, Mike Landrigan, C. M. Gething, and Bill Springer wandered over to the east of the Salmon, and prospected a section that lies about 20 miles southeast of Toad mountain. They found what they were looking for and returned to Nelson the fore part of the week to see if it was really as good as it looked. Ellis, the assayer, made three assays; one yielded \$286 in silver, \$3 in gold, and 20 per cent lead; another, \$103 in silver and 34 per cent lead; and another, \$3 in silver and \$12 in gold to the ton. They claim the ledge is in place and of good width.

KASLO CREEK.—The Kaslo creek excitement continues. George Keeler and M. C. Monaghan returned to Nelson the latter end of the week and report making five locations. They say the mineral belt extends for several miles and that a number of locations have been made at the head of the Slokan, which is some 15 miles west of Kontenay lake. The mountains are reported high with grass-covered slopes on one side and precipitous broken ridges on the other. There is still a great depth of snow in places.

COLORADO.

LITTLE ANNIE.—Aspen *Times*, Sept. 8: Several months ago, John W. Atkinson and John Holbrook sold an option on 232,500 shares of stock in the Little Annie Mining Company to B. Clark Wheeler at 25 cents a share, and several days ago the sale was consummated, and \$14,000 paid with time and interest on the balance. This will give Mr. Atkinson the snug sum of \$50,000 for his tenth of the stock of the company, or at the rate of half a million dollars for the property before the Richmond, Iron and Eclipse claims were conveyed to the company. Now Mr. Wheeler is selling 100,000 shares of his stock at 30 cents a share after conveying to the company those three claims which, together with the Little Annie, Eureka and Judy, gives the company six claims, covering nearly 2000 feet of the apex of the great mineral contact at a point which contains one of the most extensive ore chutes in the country.

THE GRAND UNION CONSOLIDATED.—Hon. E. P. Cowen of Dallas, Texas, president of the Grand Union Consolidated Mining Company, is visiting Aspen, and is arranging, in connection with Major A. J. Pickrell, manager, to push the work on the company's 70 acres of patented property in Conundrum gulch. The company has 300,000 shares of stock in the treasury for working purposes. Good shipping ore is already developed in several veins on the property. Only about 50 feet more work in the 700-foot tunnel will cut one of the richest and strongest veins on the group, and the work will be pushed forward. The group also contains the extension of the great Cummings lode, which will be developed in the near future.

THE MOLLIE GIBSON COMPANY was sampling some of its rich ore at Taylor & Brunton's yesterday. Great chunks of native silver glistened as the great jaws of the crusher masticated it into a fineness for sampling. Ore has been struck in the Howard Russell, one of the Climax group. The formation and character of the ore are similar to the Little Annie. The property is owned by Cowenhoven & Brown, Al Hopely, ex-Mayor Reese and B. Clark Wheeler, and is being worked under lease and bond by Charlie Miller and Mr. Reese.

NEW MEXICO.

AT BURRO.—Silver City *Enterprise*, Sept. 11: Capt. Fitzsimmons, Supt. of the Hobson mines at Alhambra and the Eckles mines in the Burro mountains, came in Wednesday and reports prospects at both mines very favorable. He promised detailed accounts of development work on these properties on his next visit to Silver city. Hank Dorsey and Willis James are taking out high-grade ore from the Moonlight claim at Bald Mountain. The mine is owned by Mayor Fleming and Hank Dorsey; over 200 tons of ore is now on the dump and hauling will be commenced next Monday. The ore will be worked by Milstead & Co., at the Bremen mill. If all the miners in this section who have mines with pay ore in sight would expend their muscle in polishing a drill instead of wagging their tongues about the merits of their mines, they would not only demonstrate the value of the mine, but money would be more plentiful in their own and everyone else's pockets. Now that you have facility for milling your ore, stop blowing about your mine and work it. Dig up or shut up. The Mitchell M. Co., on the Mangus, while working along very quietly, has been meeting with extraordinary success in the shape of very high grade ore extracted from the mine. Good ore bodies running from \$200 to \$250 per ton have been worked and the ore milled during the past two months. Large quantities of the same grade of ore still show in sight in this mine. This property is conducted on the noiseless plan, and, like several other such properties in this vicinity, is paying its owners handsome profits.

SHIPPING ORE.—*Southwest Sentinel*, Sept. 10: Chas. Shannon is shipping ore from the Hughes & Shannon mine, which is believed to be the best copper property in the Clifton district.

THE AZTEC MINING CO. now keeps five eight-horse teams constantly on the road hauling down about 30 tons of ore a day from its mines at Pinos Altos to its mill here. Development on these mines is kept well ahead of the stoping all the time. The first shipment of amalgam from the Rain-in-the-Face mill under its new management came in yesterday. It was a small one, being the result of only a few hours' run; but it demonstrated in the most favorable and conclusive way what may be expected from this mill under efficient working. Another small

shipment from another mill came in about the same time.

THE TOTAL SHIPMENTS of ore, concentrates and bullion by freight and express out of Silver City during August were 35 per cent less in bulk than the shipments in July, although there was an increase of \$7895 worth of gold bullion and of 10,189 pounds of base copper and 80,000 pounds of copper ore. July, however, was an exceptionally big month, and the August shipments just equaled the June output in bulk, while the bullion shipments have been quietly and steadily increasing. The figures for August are as follows: Copper in bars, 30,221 lbs.; copper ore, 80,000 lbs.; high-grade gold and silver ores in sacks, 39,230 lbs.; lead ore, 280,000 lbs.; concentrates, 441,000 lbs.; iron ore 3,300,000 lbs.; gold dust and bullion, \$24,168. Owing to part of its new pump having gone astray in shipment here, the Silver City M. & M. Co. was unable to get the Bremen mill started up as soon as expected. Duplicates of the missing parts have been shipped and are now on their way here. The company expects to have the mill ready for operating on custom ores by next Monday. Teams were put to work hauling in ore from the Monarch and Copper Point mines to this mill yesterday. To-day freighters begin bringing in 300 tons of ore from the Good Luck at Lone Mountain for treatment.

DAKOTA.

AN IMPORTANT UNDERTAKING.—Deadwood *Pioneer*, Sept. 8: The statements recently published by the Homestake and Deadwood-Terra Mining Companies have opened the eyes of mining men. They show that for the past year the Homestake ore has only run \$3.60 a ton, while the Deadwood-Terra only goes \$1.40, yet the former has paid ten-cent dividends every month, and has a surplus of \$120,000, while the latter has piled up a surplus of \$300,000 and is paying five-cent dividends every month. The success of these mines in making low-grade ores pay has stimulated others, and a movement is now on foot, headed by the leading men of the Black Hills, to erect an immense custom mill at some point that is reached by railroad connections, and can furnish sufficient water power to run the mill. At present, B. H. Pourche is the point that offers the most favorable opportunities, having a large water power, and being connected with the free gold belt by a full railway system. There are immense bodies of low-grade gold ores in the vicinity of Central, some vertical veins and some flat cement deposits. A most painstaking examination of these has been made, and they were found to average \$1.90 per ton. The cost of mining, milling and transportation is estimated at \$1 a ton, leaving a profit of 90 cents. The intention is to have 2000 stamps working on this ore, crushing 3000 tons daily. It takes but little thought to see what immense benefit such an undertaking would be to the country, giving employment as it would to about 2000 men. A strong effort is being made to enlist Eastern capital in the scheme, and the promoters are sanguine of their success.

OREGON.

AT ROCK CREEK.—*Bedrock Democrat*, Sept. 9: Mr. C. M. Foster, who is of many years' practical mining experience, stated that the Chloride is making a splendid showing. The company has a force of 12 miners at work and the force will be increased in a few days. A new tunnel, to be 120 feet in length, has been commenced, which will tap the vein at a depth of 340 feet. When the vein is reached they will run both ways and drift all winter. Mr. Foster says the Chloride vein will average about six feet in width, and will go from 50 to 200 ounces of silver to the ton. Work is also progressing on the Forest City, owned by Dr. Fehrenbach and others of Portland, and a splendid showing is being made. Mr. Foster speaks in favorable terms of the mining outlook of Rock Creek district and predicts a grand future for that section.

THE JAY GOULD.—A *Democrat* reporter yesterday met W. H. Spagha, one of the owners of the Jay Gould, a promising mining property situated in the Pocahontas district. The gentleman stated that the mine has been undergoing extensive development for the past few months, and that the vein, which is of good width, is showing up in fine shape. Three cuts have been run on the property, and a 70-foot tunnel, which will tap the ledge at a depth of 50 feet, is now being run. Mr. Spagha informed the reporter that the five-stamp mill is about completed, and that within 10 days the stamps will begin dropping on the Jay Gould ore. There are 50 tons of ore on the dump, which will go over \$40 in free gold to the ton. The owners of this property are W. H. Spagha, A. E. Birdsall, John Lew and Messrs. Chadd and Macy.

UTAH.

CRESCENT.—Park *Record*, Sept. 12: The Crescent is destined to be one of the greatest mines in the West. There is a great improvement in the ore body on the 200 level since last spring, it being larger and containing much better ore in general, besides which the first-class ore is more numerous and richer. Mr. Hickey, the genial foreman, has this level in excellent shape and the ore is handled with greater ease and much more rapidly. Prospecting is also going forward rapidly and the vein is being uncovered both on its strike and dip, and much stoping ground is consequently being added. While the 300 level was not visited, the *Record* man was informed that it was looking very well and showed a general improvement both as regards the permanency of the vein and the quality of the ore. The Crescent is in good hands, and Supt. McGregor will yet bring the property to that stage when dividends will be the order of the day.

SILVER KEY.—The lessees of the Silver Key have cut through the low-grade body of ore mentioned in last week's *Record* for a distance of 25 feet, and still the foot-wall has not been reached. The ore runs 12.60 ounces in silver and 8 per cent lead and can be concentrated. With a backing of good ore, and the Silver Key has a rich vein in the old works, this immense body of low-grade rock will be a fortune. With modern appliances for concentrating ore, this huge vein should be made a rich producer. The tunnel is still being driven ahead. The starting of a three-compartment shaft on the Daly West, the rumored rich strike in the Meers group and the operations going forward in the Black Diamond and

Nimrod, are attracting considerable attention to that section of Utah mining district and creating considerable speculation as to what the results are going to be.

WASHINGTON.

IVANHOE.—Okanogan *Outlook*, Sept. 12: James Laraway came down from the Ivanhoe yesterday and reports work progressing favorably on this bonanza property. J. A. Nagle of Wilkesbarre, Pennsylvania, passed through our city last week en route for home, where he will remain this winter. While in Okanogan county, Mr. Nagle secured some very good mining interests, including a new location of great promise in the Wanicut district. The ledge is about 20 feet wide and carries both silver and gold. J. W. Shull has a force of men at work on a new location up near the head of Salmon creek. The ledge is 2½ feet wide, and assays as high as \$600 per ton in silver. Ed Harvey and H. J. Miller have finished their contract on the Buckhorn and Frankie Boy claims and moved down from Mineral Hill Wednesday. The Buckhorn ledge has improved greatly; during the last ten feet the boys run in the tunnel. They brought down some fine specimens of ore, showing gray copper and brittle silver.

LOOMISTON.—Okanogan *Outlook*, Sept. 5: The latest and liveliest camp in Okanogan county is that which has recently sprung up at the foot of Palmer and close to the War Eagle and Black Bear mines. Three months ago Loomis & Co., with their store, residence and lodging-house were the only inhabitants of the place. To-day there are from 15 to 20 buildings either completed or in course of construction and a community of from 150 to 200 persons are actively engaged in the work of building up a town and making homes. This change of affairs is due directly to the efforts of that enterprising and energetic gentleman, S. I. Silverman, in putting up here the first quartz mill ever built in Okanogan county and which is now operating with such gratifying success on the ore of the War Eagle and Black Bear mines. The mill started up on the 20th of July, and has been in operation about six weeks. As near as we are able to learn, it has produced in that time upward of \$10,000 in free gold. The concentrates, we are informed, represent about one-quarter of the value of the ore, which would add \$3000 more, making a total of about \$13,000 as the net proceeds of the mill on a six weeks' run.

Mining Share Market.

The way in which mining shares are being manipulated is a continued source of surprise, for hardly does the nimble chipper begin to master the true inwardness of the moves than a change is made, which again leaves him at sea. This week there has been a steady but quiet increase in the quotations for the North End stocks and a decidedly firmer tone, with fluctuations in the Gold Hills, while the Middle were seemingly left without a father. What will be the next change in the manipulation is a conundrum, and the persons who guess it correctly will do exceedingly well. So far the writer can learn, the more successful outside operators look for quite a setback soon. What they base this opinion on is more than can be learned, unless it be that no deal has been a continuous up move until top prices have been reached. There is no denying but usually well-informed persons do not look for much ore to be shown up on the present deal, for they expect it to be of an all cry and no wool character. It is a notable feature of the present move in stocks that several of the more successful monied operators are "noisy" around. They usually come out of their hiding places when an opportunity presents itself of making quite a turn in the market, either as bulls or bears, or as both, by turns.

In outside shares slightly more attention appears to be given to the Tuscaroras and Bodies. The increasing interest in the mining shares of these two districts is said to be largely due to the growing importance of the work, and also to the belief that the stocks are fairly well concentrated and that if inside holders do not make a deal soon, it will be hard to get one up before next spring. There is said to be considerable ore taken out of several of the Tuscarora mines, and which can be so milled as to foster a slight boom. From the Bodies the advices are of a still more encouraging character. In Bulwer another crosscut is under way to cut the rich ore found near the Standard line, and if they succeed in striking it, there will be no disputing it belongs to the mine. The Standard mine continues to turn out its regular quota of bullion. It was contemplated to start up the Bodie mill on either Bulwer or Bodie ore (both mines are reported to have considerable rich ore on their respective dumps), but for some reason it was deferred, probably to allow of the surplus funds being used up which would admit of assessing the stocks, by which they would frighten outsiders into selling. The work going on in the Bodie mine is of a very interesting and important character. Ore, it is said, is being taken out which ought to pay dividends, while it is claimed that there is every encouragement for believing that one of those blind, but very rich, pockets may be struck at any time. Secret work with this object in view, it is reported, is being done on a level which the superintendent evidently forgets to mention in his official letter.

This (Thursday) morning mining shares opened dull but strong. There is a general belief among well-informed brokers that there is a line of shorts on the market, principally on the North End stocks.

The news from the Comstock mines does not justify the assertion made by some that the pool will show up any new development of ore this year, but, on the contrary, everything warrants that the work is not only to kill time, but get the mines into still better condition for next spring's deal. While saying this, the fact must not be lost sight of that a good sized deal can be made this year without much showing of ore. There is a large amount of secret work going on in several of the mines, of which it is difficult to get particulars as yet. The pool has succeeded most admirably in getting miners who know nothing after getting of the mines, so that they might as well be deaf dumb and blind so far as they are of benefit to outsiders. An improvement is reported in Ophir; in Sierra Nevada they are in vein material, while good news continues to be received from the middle mines. Within the next 90 days very important work ought to be inaugurated in the Gold Hill group.

MECHANICAL PROGRESS.

Why Ball-Bearings are not Used in Machinery.

The plain, unadorned reason is that such bearings are much inferior to what are termed parallel bearings for all horizontal shafts.

A shaft or journal being true, properly finished and running within, or having run upon it a cylindrical "box" or "quill" which is also true and correctly fitted, and having between the two surfaces some oleaginous substances, as oil, plumago or grease uniformly supplied, is, so far as the world's experience to date, the ideal form of bearing.

It is important in such bearings that the two surfaces should be of dissimilar material. To obtain the highest results one of them (preferably the shaft) should be as hard as is consistent with strength, and the other should be of a somewhat softer material, though some of the best bearings ever made have had both surfaces hardened. This, however, calls for better workmanship and more thorough lubrication.

There are a few cases apart from cycles where the ball-bearings may be said to have advantages, as, for instance, heavy turrets or domes for astronomical observatories. In such cases the plane of rotation being horizontal, the weight is taken by all of the balls at once, while in the case of a horizontal shaft the load is borne by only a small portion of the balls at one time, and even then, if one ball is larger than the others, that one will have all of the responsibility while it is passing the "tight" side.

In these large slow-moving vertical bearings the balls may be so placed as not to rub against each other, which is a matter of no small importance. Again there are cases where the weight of a vertical shaft is supported by a "collar," so that the bearing surface must be at a distance from the center. This may sometimes be best accomplished by means of a properly proportioned ball-bearing, especially if the weight and speed are not excessive.

In bearings requiring rigidity and accuracy, as lathe spindles, the balls have been often tried, but such lathes are not in favor. This state of things could be helped materially if it were possible to make absolutely round balls, but that has never been done, though the manufacture of balls has been very much improved within the last few years.

Much more would no doubt be done toward overcoming the weakness of the ball-bearing for machinery if there were any advantages in it, even in a more nearly perfect form.

The excuse that exists for the ball bearing in bicycles is not valid anywhere else, and it is not an unmixed blessing even there. But two claims are made for it, viz., ease of running and the quality of being adjustable. As to the first, it simply isn't true, as any practical man knows if he has investigated the subject (and if he hasn't his opinion doesn't count). In making this statement I am assuming that the bearings are clean and properly oiled, for I readily admit that ball-bearing will run with more dirt and less oil than will the other kind, and when you have allowed the dirt to supersede the oil for a certain length of time, you may get a new bearing in either "case".

Except in some special cases, the ball-bearing is a decided disadvantage in machinery, to say nothing of its first cost. The parallel bearing being neater, stronger, smaller, cheaper, safer, and infinitely more durable, it naturally stands as a monument to that great and unget-overable fact, "the survival of the fittest," and I am willing to go on record as saying that it will stand.—*Cor. Wheel and Cycling Review.*

THE FATIGUE OF METALS.—With respect to statements that occasionally appear on the subject of the fatigue of metals under long-continued stress, a report that has recently been published regarding two similar suspension bridge links, is worthy of notice. A square iron link, 12 inches wide, 1 inch thick, and about 12 feet long, was taken from a bridge, then about 40 years old, and tested against a similar link which had lain unused in store ever since the building of the bridge. The means of comparison were, therefore, excellent, and the result should go a long way to show whether or not iron really does lose any of its strength in prolonged service. The effect of the tests was to determine for the old, used link an ultimate tensile strength of 21.8 tons per square inch, an elastic limit of 11.1 tons per square inch, an elongation of 14.05 per cent, and a contraction of 17.35 per cent at the point of fracture. For the unused link, the tensile strength was found to be 22.2 tons per square inch, with an elastic limit of 11.9 tons, and elongation and contraction at fracture of 18.42 per cent and 18.75 per cent respectively. The two pieces of iron were, therefore, of practically identical strength, the small difference actually observed being well within the ordinary range of variability of similar pieces of the same metal.—*London Iron.*

A MUCH NEEDED INVENTION is announced by Machinery of London, which consists of a device for automatically shutting off the gas when it has been blown out instead of being turned off in the usual way. The principle upon which the invention is based is the expansion and contraction of a metallic loop made of German silver and steel and which is adjusted very close to the gas flame. One end

of the loop is free, while the other is secured to the fixture. A valve controlling the gas is attached to the free end, and when the gas is burning the valve is open and the gas freely escapes. If, however, the gas is blown out, the loop will quickly cool and contract, and the valve will shut off the gas. It is said that the device is exceedingly simple and it responds quickly to the change in temperature.

A USEFUL INVENTION.—One of the most ingenious, and at the same time practically useful among the automatic machines which have been introduced of late, is a device which forms, fills, weighs and seals packages in those establishments where large quantities of goods, such as fine-cut tobacco, soda, starch, etc., are constantly put up. The operation by which this result is accomplished, though decidedly novel, is not at all complex in any particular, the machine consisting merely of a series of forming blocks, receptacles, folders, gammers and feeders, all working in mutual harmony, so that packages are smoothly and continuously produced. The forming blocks successively size the paper, which instantly afterward is wrapped around them, folded and gummed at the end; the paper sacks are then plunged into receptacles filled with the commodity for which they are intended, finally folded on top and sealed.—*N. Y. Sun.*

A CONVICT'S INVENTION.—A press report from Boston states that John E. Foster, a convict now serving a 25-year term in prison, in Massachusetts, has invented a new type of marine engine which is attracting much attention from leading mechanics, and will be patented as soon as a model is completed. In his invention no eccentric is used, and the engine was reversed without slackening speed by means of a button, but on a large engine a treadle would be used. The reversing was done so quickly that one could hardly tell that the engine had been reversed. Only three valves are used and they are self-acting. There is no steam chest and no condensed steam can get into the cylinder. He claimed that the engine is more powerful than a Corliss, and there is less expense attending it. The speed is faster than a Corliss or an oscillator. One feature of the engine is that the piston when detached, can be reversed.

A NEW WELDING POWDER.—An excellent powder for welding wrought iron is described by a German contemporary. It consists of borax, 50 per cent; sal ammoniac, 25 per cent; water, 25 per cent. This mixture is boiled, being at the same time continuously stirred until it is reduced to a stiff mass, which is then held over a fire until it becomes hard. When cold, the mixture is well pulverized and assimilated with one-third part of rust-free wrought iron filings. The pieces to be welded are first dovetailed, or otherwise connected; the welding parts are then heated to redness, when the powder is strewn over them and allowed to liquefy over the fire. Only very slight blows are then required to consummate the perfect conjunction of the pieces.

STRENGTH OF ANCHOR BOLTS SET IN PORTLAND CEMENT.—From a number of careful tests lately made to ascertain the precise strength of anchor bolts set in Portland cement in the ordinary way, the fact appeared that the joint was really stronger than the stone. In this demonstration, two-inch iron rods were set into the stones some 11½ inches, and then subjected to the test. The first rod had a screw thread to improve the grip of the cement, and the cement began to yield at a load of 32,000 pounds, the breaking of the stone taking place at 50,000 pounds. With a plain, smooth rod, it was found that the cement began to yield at a load of 34,000 pounds, but the rock broke at 67,000 pounds.

SUPERIORITY OF AMERICAN FIELD GUNS.—The new field guns turned out at the Watervliet arsenal for the army are demonstrating their superiority to anything of equal caliber that Krupp can show. The battery of four pieces of 3.2 inches caliber, tried by Light Battery F, Third Artillery, on the banks of the Guadalquivir river, could send shells a distance of five miles, and the extreme range with accuracy was probably not far from 2½ miles. The remarkable unanimity with which the shells pitched practically into the same spot when fired at the target was proof of the exactitude to which gunnery has been reduced.

THE WEAR OF STEEL RAILS.—A Belgian statistician has compiled some figures on the subject of the wear of steel rails, according to which, under normal conditions, every geographical mile of railway track loses two and one-fifth pounds by the passage over it of each train. As the length of the permanent ways on the globe amounts to nearly 60,000 miles, it follows, if a daily average of ten trains be taken, that the total loss suffered each day by the metallic rails of the earth will be about 600 tons.

AN IMPROVED WELDING PROCESS.—From Chicago comes the news of a new process of welding, which is performed by simple friction. The pieces of metal which are to be joined together are placed in a lathe and rapidly rotated. At the point of junction the ends are pressed into a die, thus giving the pieces the desired shape. The high temperature necessary to perform the welding is, it is said, the result of the rapid movements of the pieces under pressure.

SCIENTIFIC PROGRESS.

Peculiarities of Tornadoes.

The tornado which wrought such destruction at and near the town of Mexico, Missouri, on the 20th of May last, has probably been more accurately studied than any other which ever occurred. The speed of its forward movement was accurately determined by the difference in time at which it struck and broke a line of telegraph wire at two different localities, 28 miles distant from each other. It was 27 minutes in traversing that distance. The tornado's general route was more direct than that of the wire; but its zigzag course just about made the difference equal. During its passage, its gyrating force and velocity was terrific. Its roar at one point, when it rose at a great distance above the earth and among some low-lying clouds, is said to have been heard at a distance of 25 miles at a right angle from its course.

During its greatest fury, the center of the disturbance was marked by a white steamy streak, about a foot in apparent diameter, which swayed to and fro, and at times parted in the middle, the upper portion slowly rising and passing slowly out of sight. The funnel cloud, when simply traveling, was dark, but when it encountered any tall obstacle, where work was to be done, the white streak appeared and touched with its point the object, with the delicacy of a serpent's tongue, but at the same time with a force which sent everything movable whirling into the air. When it approached any very large obstacle, the cloud seemed to reduce its flight, mass itself together, throw out great filmy, revolving tentacles, which would dart violently out and in, while doing its work of destruction. The electric displays, to the eye, were not more remarkable than is often witnessed in large ordinary storms. Where it passed along with comparative quiet, crisply burned green leaves were afterward observed, indistinct heat, either electrical or frictional.

When passing over level ground, without obstacles in the way, the forward movement was very rapid; but when doing destructive work, it appeared to halt or move more slowly.

The average course of the tornado was west; but it zigzagged to the north and south, whenever any obstacle like a house or barn or trees appeared at a distance of a mile or less from its direct course. In one instance, after destroying a house, the cloud divided—one portion going directly west about half a mile, and parallel to its general course, where it did its work of wrecking a house; the other portion moving off in a southwest direction some three-quarters of a mile, where, after unroofing a barn, it turned back northwesterly, and the two united and passed on westward, in a zigzag course, working destruction to all elevated objects along the way. There appears to have been a slight separation and divergence several miles farther on, and then a reunion. The deviations from a straight line were generally about half a mile, the cloud always returning to or passing over the central line of course and again returning.

As we have condensed this description from the *Scientific American*, which gives a diagram of the course of the tornado, showing the different points where houses, barns and trees were attacked. The diagram shows nine points where the tornado crossed a line drawn due east and west, and at no place it does not appear to have moved from this line over three-quarters of a mile. It crossed a little stream in its course, and objects beyond that point were besmeared with mud, which must have been taken up from the bottom of the stream.

The upward vortex and onward motion of this storm must have continued long after the cloud rose from and ceased its destructive action upon the earth, for objects as large as window sashes were found fully 30 miles distant from the point where the destructive action of the storm disappeared.

Careful observations have shown that the barometer cannot be depended on as a tornado warning. The atmospheric disturbances must be confined within quite a circumscribed area, and without any change in the upper atmosphere. There was very little rain in the immediate vicinity of the center of disturbance, but at quite a distance, hailstones weighing two pounds fell, evidently from a great height. The lumps of ice were of irregular form, but on carefully noting them through, they were found to be formed around a small spherical center. Some of these hailstones penetrated to a depth of 10 and 12 inches into plowed ground.

At one point the path of the storm passed within observing distance of some large factories, from whose furnaces the smoke rose perpendicularly to a great height, where it was suddenly cut off by an upward current flowing toward the storm, the air rushing in to fill a vacuum. In addition to the diagram above referred to, the journal from which we condense gives several engravings, evidently from photographs of the ruins of houses demolished by the tornado. The study of this will no doubt add much to the knowledge which is being accumulated in relation to the causes and phenomena connected with destructive tornadoes.

PRIZE FOR A SMOKE ARRESTER.—It would seem that notwithstanding the great number of valuable devices for preventing the smoke nuisance in cities, even approximate perfection

in this line of invention has not yet been reached; for late European papers announce that the German Government has offered a prize for the best scheme to abate the smoke nuisance in cities. The prize is published as 3000 marks, which is no doubt a mistake, as that would hardly pay for a good essay on the subject. However, it matters not what the prize may be; the result will be the production of something of value. This and kindred subjects are now being thoroughly investigated in Germany, and people will be anxious to hear the result in this case. It is time that more attention was being paid to this matter in San Francisco. Notwithstanding our almost constant westerly winds which blow the smoke and poisonous sewer and other gases into the bay, there is a crying need that more attention should be paid to reducing the useless production of such unhealthy nuisances. The finer the day in this city the more smoke and foul sewer gas we have, and every year adds to the volume and intensity of both.

A STRANGE FEATURE OF MAGNETISM.—The *American Machinist* describes a strange feature in magnetism, which any one possessed of two bar magnets and a small screw can demonstrate for themselves. The feature alluded to is that decreasing the contact surface increases the attractive force of a magnet. This seems hardly credible, but can readily be proved. Take two bar magnets and place on the lower one a common iron screw, head down. In this position the lower magnet has the advantage of gravity to aid in holding the screw, as well as the apparent advantage of the much larger surface of the screw-head, as compared with the point. Now lift the upper magnet from the lower, and it will be found that, contrary to what seems to be a reasonable belief, the screw will be lifted up with the magnet. This is about the simplest test for this strange phenomenon of magnetism. The great contrast in area of points of contact, and the weight of the screw adding to the load to be lifted, makes it about as convincing as even the most skeptical can demand.

A NOVEL TOY HEAT MOTOR has been devised which depends for its action upon the fact that nickel is magnetic at ordinary temperatures, but at 300° C. becomes suddenly non-magnetic. A slip of nickel is attached to a disk of copper suspended by two strings, so that it can swing like a pendulum. On one side of the hanging metals is a magnet, with which the piece of nickel is ordinarily kept in contact and held by it. By placing a gas flame or a spirit lamp underneath the nickel, so as to warm it, it becomes so heated as to lose its magnetism, or power of being magnetized, and falls off, the pendulum thus making a swing. By its passage through the air, the nickel is cooled below the critical point, and on returning is held again by the magnet, only to fall off again as before, and so on with considerable regularity so long as the source of heat is kept up.

A NEW LENS has been devised, the object of which is to throw the rays of electric light in annular concentration, thus making use of its vast illuminating power in a direction to be most available. It dispenses with the use of a shade or concave reflector, and concentrates the light in an annular horizontal zone; but when it is desired to project the light to one side only, and with augmented strength, the inner or concave portion of the lens can have amalgam applied to any part, say half of its surface, more or less. This lens will accomplish what no shade or reflector will do, and it is thought that its strong points of merit will doubtless make it highly popular in the great illumination of the near future.

MEASURING THE HEIGHT OF WAVES.—An apparatus for measuring the mean level of the sea is announced. It is based on the principle that when a liquid wave traverses a capillary tube or a porous partition, its amplitude diminishes, and it is retarded in its phases without the mean level of the wave changing. It consists of a glass tube, the lower end communicating by a flexible pipe with a plunger which is lowered beneath the lowest water level. There are two cells in the plunger, the lower being filled with sand and open to the sea, the result being that the column of water in the tube rises and falls very little with the tides, and the mean sea level can be read from a graduated scale.

PHOTOGRAPHING ANIMAL MOTION.—Scientist Anschütz of Liess, has perfected a set of photographs of a dog in the act of jumping over a small bush. In the act of making one jump the animal was photographed 24 times, and each picture is not a mere silhouette, as was the case with Muybridge's first attempts of this kind, but a little picture showing half-tone and detail.

A NEW SWEDISH GLASS is claimed to have important advantages for microscope and other fine lenses, giving greatly increased power. The chief improvement over other fine glass consists in the addition of phosphate and chlorine, which impart absolute transparency, great hardness and susceptibility of the finest polish.

A HUGE MICROSCOPE.—There has just been completed in Munich a huge microscope, with a magnifying power of 11,000 linear perspective. Electricity is brought into service in the operation of the great instrument, the cost of which is \$8750.

ELECTRICITY.

IMPROVED METHOD OF TRANSMITTING ELECTRICAL ENERGY.—There was a brief reference in our last issue to some experiments which are being made in Europe, looking to an improved method of transmitting electrical energy. On Tuesday last, we received the following note from Mr. Wm. C. Qalby in regard to the matter: Darling the past three months there have been published in the *Electrical World* several notices of the apparatus to be used in transmitting electrical energy over long distances. The system to be employed is one that has been tested in a small way before, and consists in using alternating dynamoes of low potential—say of 2000 volts and 1000 amperes, or 2,000,000 watts. This current is then passed through a converter, which raises the potential to 20,000 volts and reduces the current to 10 amperes. A No. 6 copper wire will carry this current at a small loss for a very long distance. When the current reaches the point where it is to be used it is passed through another converter, which reduces the voltage to any point that may be desired and, as a consequence, increases the current to a proportional number of amperes. The loss by the converters and the line wire need be simply one of electrical resistance and leakage, and in the case under consideration, and say for a distance of 50 miles, would be about 40 per cent; that is to say, you would recover in electrical energy 60 per cent of the power of the engine or water wheel that drives the dynamo.

THE NORTH BEACH AND MISSION LINE.—It is confidently predicted that by May next, the citizens of North Beach will be able to ride either to the foot of Third or to Twenty-Sixth Street in electric cars. Mr. Skelly, the superintendent, says the company is going right ahead with the work of electrifying electricity for horse power. He further says that the company had well nigh completed its arrangements for putting in cables; but the recent favorable reports in regard to the working of electric roads has finally determined the managers to make the change in favor of the latter. Overhead wires will probably be used, as the company secured a franchise for such right over two years ago, and before the recent opposition to such use was set on foot. The franchise is good and cannot be set aside. The cost of the motor plant and cars when ready for operation, will be about one million dollars. Bonds will be issued for raising the money. The poles to be used for suspending the wires will be of the most approved and ornamental pattern. Several designs have been presented by our local foundries, and it is probable that the one submitted by the Eledon Iron Works will be accepted. It is but little larger in diameter than an ordinary lamp-post, which it much resembles in appearance. It is jointed and riveted, and filled with iron shavings, packed in a peculiar manner, to give it great solidity and strength, combined with comparative lightness.

THE STOCKTON ELECTRIC ROAD.—Ex-Congressman James S. Louttit, of Stockton, has consummated a transaction by which the Stockton street railway passes into the possession of a company of San Francisco capitalists, who will replace the present mule-car line with an electric road, having ten miles of double track. The same company which will operate the street railway will probably furnish Stockton with electric light, and will illuminate Goodwater Grove, which will be transformed into a park, especially for evening recreation. About \$15,000 will be expended in sinking a natural gas well, and \$25,000 will be devoted to the improvement of the grove. One terminus of the road will be at the grove and the other end of the line will leave the passengers at Jackson Park, where there are 25 gas wells, one of which produces daily from 90,000 to 100,000 cubic feet of gas. Water which is said to be developed with the gas is said to possess curative qualities, especially beneficial for rheumatic troubles and skin diseases. Swimming baths, into which this water can be turned, will be constructed, and \$460,000 will be expended in Stockton as a result of the investments of San Francisco capitalists.—*Pacific Lumberman.*

THE NEW YANKEE ENTERPRISE.—This is what the *Electrician* of London says of the development of electrical traction in this country: "A large and varied assortment of reasons can readily be marshalled up to account for the rapid development of electric traction in the United States and its analog progress in the United Kingdom. If a reproduction of the results obtained with the electric cars on the Boston West End Railway could be guaranteed on this side of the Atlantic—and we know of no insuperable obstacle—even the most cautious of tramway directors might be induced to emerge from the 'experimental stage.' In Boston, electric traction costs nearly 10 per cent less than horse traction per mile run, and its net earnings amount to over 77 per cent more. Meanwhile, we in this country are still hammering away at battery traction, pending the advent of the perfect closed conduit." Our English cousins need a little Yankee enterprise to wake them up.

THE SURVEY COMPLETED.—The plans and surveys for the Sutter and Yone City electric railroad are completed. This will be one of the most extensive electric

systems yet proposed in this State. The road will be 12 miles in length, connecting with all the principal towns along the mother lode in Amador county. Two surveys have been made both north and south of Sutter creek. The engineers are reticent as to their plans and as to which route is the best. The cost per mile is more than was at first anticipated. No difficulty is anticipated in securing the right of way, whichever route may be selected, for all agree that the road will be of great advantage, not only to property along the road, but to the whole county as well.

THE SAN JOSE ELECTRIC SYSTEM is to be extended a distance of two miles. A franchise has been prepared, and will no doubt be adopted by the Board of Supervisors before this item reaches our readers for an electric road to Oak Hill Cemetery, petitioned for by Jacob Rich, who will extend his first street line to the city of the dead, a distance of two miles. The most important provisions of the franchise provide for the laying of a plank sewer, four by eight feet, in a ditch on the west side of the Monterey road at the expense of Mr. Rich and the property owners along the route; that the sewer shall be covered with earth up to the level of the road and the tracks laid over it. Cars shall be run every half hour and single fares shall not exceed five cents each way.

STREET RAILWAYS. of all classes, are the best paying investments in the country. The *Electrical Age* of New York gives a list of regular quoted prices of 84 street railroads, 53 of which are quoted at or above par. Quite a number are quoted as high as two and several as high as three times their par value. No other industry in the world can make such a showing. These prices, it should be borne in mind, are quoted for New York City. There are probably hundreds of street railroads not registered in New York which are equally as well-paying investments and bring equally high prices in their several localities.

THE PONDROUX BATTERY.—Flavien Pondronx of Paris claims to have solved the long existing problem of a substitute for dynamo in electric lighting by providing a cheap, inodorous, inoffensive electric battery capable of supplying light enough for domestic use." Mr. Pondronx claims that by the construction of this battery he is enabled to employ a great surface of zinc in a cell of moderate capacity containing little liquid. The ingredients of the solution, he adds, are very cheap.

OAKLAND AND PIEDMONT.—It is reported that Theodore Meitz has made arrangements for placing bonds to the amount of \$100,000 on the Alameda, Oakland and Piedmont railway, and will soon begin the equipment of the Santa Clara avenue and Park street lines, Alameda, with electric motors. The Park street road will be built as soon as the bridge is completed, so that the road may be operated to East Oakland.

ELECTRIC OR HORSE.—Messrs. Benj. Morgan, W. C. Upton, Adam Green and W. S. Porter have made application for a railroad franchise along the following streets in Berkeley: From western terminus of Channing Way to Anduhon street, to Dwight Way, to College Way, and thence to town limits. The request is for either horse or electricity. If granted, electricity will undoubtedly be used.

A LESSER LIGHT PREFERRED.—The *Electrical Review* says, in the course of an editorial: "Electric lights in the interior of trolley cars have been objected to by people who ride out of town to get a cool and rapid view of the surrounding country. A company could make its line quite popular with the younger contingent if the lights were extinguished after leaving the city limits."

FROM OAKLAND TO HAYWARDS.—It is reported that the Haywards, San Leandro and Oakland Electric Road Company expects to have the iron and ties on the proposed line of its road within three or four weeks. It will take 13½ miles of iron for the single track. The grading for the fill between San Leandro and Haywards will be finished in a few days.

ELECTRICAL INVESTMENTS.—The *Electrical Age* of New York quotes the price current of no less than 160 companies engaged in various electrical industries, aside from street-car companies. These companies represent a capital of \$380,615,000. Sixteen of these companies are quoted above par, and represent over \$27,000,000 capital.

THE RACE OF IMPROVEMENT.—As showing the tendency of the march of improvement in this age of progress, we would state that after July, 1892, no horse-cars will be permitted to run in the streets of Washington, D. C. It will not be many years before a street-car drawn by horses in any large city of the United States will be a curiosity.

ELECTRICAL PROGRESS.—There is no branch of science where the changes are so sudden and the progress so rapid as in that of electricity. It is only by a constant perusal of papers discussing that branch of science that a person can keep abreast of it. Books are quite too slow.

AN ELECTRIC ROAD FOR WHATCOM.—The Dooley Walty Electric Street Car Company of Whatcom, Washington, has been awarded a

contract for the construction of four miles of track from that town to Whatcom lake—the work to be completed by January 1, 1892.

USEFUL INFORMATION.

The Banana a Developed Lily.

Goldthwait's Geographical Magazine says the banana belongs to the lily family, and is a developed tropical lily, from which, by ages of cultivation, the seeds have been eliminated and the fruit, for which it was cultivated, greatly expanded. In relation to the bearing qualities of this fruit, Humboldt, who early saw the wonders of the plant, said that the ground that would grow 90 pounds of potatoes would also grow 33 pounds of wheat, but that the same ground would grow 4000 pounds of bananas, the proportion thus being, to wheat 133 to 1, and to potatoes 44 to 1. The banana possesses all of the essentials to the sustenance of life. The savage of the sea Isles and the jungle owes what he has of physical strength to this food.

Wheat alone, potatoes alone, will not do this. When taken as a steady diet it is cooked—baked dry in the green state, pulped, and hollid in water as soup, or cut in slices and fried. I do not know whose hearty I admire the most—the majestic cocoa palm, with its heavy crown of great fringed leaves, or the graceful banana, with its great leaves, which are six feet long and two feet wide.

The leaves of the banana are tender, and the strong winds of the tropics—the hurricanes—soon tear the leaves in strips, thereby adding to their grace and beauty. The banana is a fruit that heats and blurs, as well as men, are fond of, and the owner, when he lives in a sparsely settled country, must needs protect his plantation by a fence of some thorn plant.

A CURIOUS QUALITY OF COTTON SEED OIL.—We have already adverted to the curious quality which cotton-seed oil possesses of taking up lead under certain conditions. That quality is now being utilized and adds one more to the numerous uses to which this remarkable product can be applied. The peculiarity referred to is shown as follows: One gallon of pure cotton-seed oil is placed in a suitable iron vessel into which 20 pounds of molten lead are poured. After a thorough stirring the lead separates into globules, and when the oil has been poured off, after cooling, there is found to be about 17 pounds of the lead, the remainder having been absorbed by the oil. On the lead being again melted, and the operation repeated to the fifth pouring—the amount of lead being less at each succeeding pouring—the total amount of lead absorbed is about 10 pounds. The oil thus charged with the lead is then used as a paint, being applied in the ordinary way to metallic surfaces. It is claimed that this liquid, which adheres closely and becomes very hard, is especially useful in protecting metals from oxidation or corrosion.

NATURAL GLASS.—A mineral discovery of unusual value is reported from Kamooraska, in Lower Canada. It is stated that an entire mountain, composed of silicates, otherwise known as vitrifiable stone, of a purity certified by the provincial engineer to average 98 per cent, has been found. This material is used for the manufacture of the finest glass, and it is believed to exist nowhere else on the American continent in such purity. The provincial government has been asked by a deputation to guarantee four per cent interest for ten years on £20,000, if a local company subscribe that amount, to develop the new industry, and has promised to consider the request if the principal municipality concerned is prepared to take a fair share of the risk.—*London Iron.*

THE HORSE AND THE VELOCIPEDE.—It is noticeable that, while the speed of various machines or instruments for accomplishing various desirable things is being continually increased, that of horses has remained at a standstill for some years past, and it is believed by some competent men has about reached its highest development. The speed of bicycles has now almost reached that of the trotting record, and is being continually increased, so that it bids fair to surpass the horse. Locomotives make faster time continually, and do it with heavier trains while on the water the transatlantic record is being constantly improved, with promise of still further improvement.

THE HEAVIEST MODERN ORDNANCE is the English 110-ton gun. Its charge is 960 pounds of the best prismatic gun-powder, and the cylindrical steel shot weighs 1800 pounds. At the last test this enormous shot penetrated entirely through compressed armor (steel-faced iron) 20 inches thick; then through an iron backing five inches thick; then it pierced wholly through 20 feet of oak, five feet of granite and 11 feet of hard concrete and three feet into a brick wall. No existing fortresses, much less armored vessels, could withstand such a shot.

PATENTS.—The average number of American patents issued yearly is about 20,000. England, which comes nearest to us, issues only about 4000 to 5000 a year, and its system is very much more lax than ours. Patents are issued without any conditions as to novelty or merit; and not two applications in 100 are rejected. In Prussia the number granted annually is less than 100; in Belgium, 1500 to 2000.

GOOD HEALTH.

The San Francisco Cancer Cure.

We are constantly receiving letters from various parts of the State, and from the Eastern States as well, asking if we have personal knowledge in regard to the truthfulness of the reported cases of cancer cures in this city, to all of which we send favorable answers. The writer, the senior editor of this paper, has made this matter a most careful study for some five years, and we are constantly more and more confirmed in the correctness of our convictions, notwithstanding the persistent denial of many physicians of this city that no such cures are being effected.

Such denial are made without personal investigation and nothing more heartless or more devoid of truth ever dropped from lips or pen. We now reiterate and declare, without qualification or fear of successful contradiction, that all that we have heretofore said in regard to this matter is correct in every particular.

If we do not state the truth, a successful disproof can easily be made and the writer he put to open shame as a falsifier.

What we have said and still affirm is that patients are constantly being cured of a malady that the best and leading physicians of this city, practitioners of undoubted skill in their profession, have pronounced malignant cancer, in such advanced states that no mistake can be made in the diagnosis. Many of these patients have been operated on and the cancer removed by regular surgeons before treatment by Dr. Cook, and the malady came again, and further operations recommended by those very physicians as absolutely necessary. We have repeatedly given the names and addresses of the patients and the physicians to whose treatment they had previously submitted. If we have made misstatements in these cases, proof of the same might be readily obtained, but none has been adduced.

We would furthermore say that the statements made to numerous patients that caustics and mineral poisons are used by this successful practitioner are utterly false and without a shadow of truth. The most malignant cases of scirrhus, both on the surface and internally, are cured by purely constitutional treatment, without so much as reddening the skin or producing the slightest internal irritation.

We hold that it is a sin and a shame that our physicians in this city, with a few honorable exceptions, persist in their personal denial of these facts, of which they know nothing from their own observation, and still refuse to investigate whether these things are so or not. Their recalcitration in the matter is leading scores to the grave in this State every month, while a little investigation would open the way to one of the greatest boons to suffering humanity which ever blessed the world in which we live.

Discharged Cured.

In proof of the above, we append the names of several patients who were discharged as cured during the week ending August 29th last:

Miss Jansen, a young Swedish girl; cancer in her mouth. Lived in the city, but has gone to a place in the country.

Miss Rose Ward of Vacaville; cancer in both breasts.

Mrs. Wyman, of Los Olivos, Santa Barbara county; internal cancer.

In each of the above cases the disease had been pronounced cancer by leading surgeons, and the knife recommended as the only remedy.

A DANGEROUS PRACTICE.—"In the course of my practice," said a prominent physician to a *Call* representative recently, "I have had a great many cases of 'white swelling' and injuries to the knee-pan among women. Usually the patient is unable to make any explanation as to how the injury was received. Some will attribute it to a strain in going downstairs, or from walking too far, or similar causes. A careful investigation of the matter, however, has shown me conclusively that these knee injuries result almost entirely from the habit, very general among women, of closing a bureau drawer by a push of the knee. This very common and mischievous practice bruises the knee, causes changes in the synovial fluid that lubricates the joint, and has even, in some cases, produced fracture of the knee-pan."

EXPLOSIVE MEDICINE.—In the June number of the *Therapeutic Gazette*, reference is made to an article which appeared in *La Pratique Medicale* for May 5th, calling attention to an accident that had happened from carrying chlorate of potassium tablets in the pocket. The tablets had been prescribed for a patient who was suffering from ulcerative stomatitis, and he was in the habit of carrying the medicine about with him. One day, as he sat down, a detonation was heard, and before he could remove his clothes, he was seriously burned. The tablets, wrapped in a piece of paper, were carried in his pocket together with a penknife, and it is supposed they detonated under the influence of concussion and set fire to his garments.

AN AUTOMATIC LIFE SAVING BELT has been tried in the Thames. It can be crowded up like a ball and fired from a cannon or thrown by hand, the belt righting itself by contact with the water.



A. T. DEWEY. W. B. EWER.

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W. B. EWER..... SENIOR EDITOR

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A. T. DEWEY. W. B. EWER. E. H. STRONG.

SAN FRANCISCO:

Saturday, September 19, 1891.

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(NEW THIS ISSUE.)

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Delinquent Sale Notice—New El Dorado Mining Co.
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Drill and Drill Rods for Sale—320 Sansome St., S. F.

See Advertising Columns.

Passing Events.

The manufacturers and employers of this city having organized and attained strength sufficient to insure success, now ask all engaged in manufacturing or employing labor, to join their ranks so that concert of action may be possible when found necessary.

The Folsom Water Power Co., whose plant is described in this week's PRESS, intend furnishing electricity for power to the city of Sacramento, conveying it from Folsom. This is a very important move indeed. It is not beyond the possibilities, within a very few years, to see electricity conveyed to the cities in San Francisco bay, from sources of water-power in the distant mountain streams. At Frankfurt in Germany, they are transmitting a power current 110 miles.

The streams are now low in the mountains,

and in many places the river-bed miners are reaping their harvest. But low water is not so good for the quartz miners, as some stamps have to be hung up.

There is nothing much new to report of the two new mining camps in Nevada and Utah. The prospectors are at work there and will very shortly determine the merits of the respective camps.

Who Would Be the Most Benefited by Bimetallism.

Last week Senator Stewart of Nevada made a public speech in this city advocating bimetallism. The arguments presented, backed as they were by a formidable array of statistics, brought the gold-bug organs to the front, and in their desperate efforts to undermine the splendid effort of the able senator, make assertions far from the truth. In their wild endeavors they either directly or indirectly claim that by remonetizing silver only mine-owners will be largely benefited. While there is no denying that the mining industry will be largely advanced by bimetallism, yet these organs appear to think that their readers are devoid of reasoning faculties, and that in being so they will accept as a fact, as the *Call* of Sept. 13 puts it, that "Mr. Stewart thinks meanly of the intelligence of the farmers when he says that they 'must have free coinage in order to get more money and better prices for their exports.' It is a very long time since any class of persons in the United States entertained the delusion that prices were governed by coinage—unless the coinage were depreciated."

The Senator's position is eminently correct. Taking the silver product of the United States and mine-owners' increased income to be derived through the remonetizing of silver would not be much, if any, over \$16,000,000, while farmers would be benefited several hundred million dollars. In confirmation of this, we will briefly state that from 1868 to 1878 the price of wheat averaged at the port of New York \$1.32½ a bushel, while from 1885 to 1888 the average was \$7 9-10 cents per bushel. To illustrate still further, the following table is given of the average prices at the port of New York:

	1868 to 1876.	1885 to 1888.
Corn, bushels.....	\$.77½	\$.60 3-5
Wheat, bushels.....	1 32½	\$ 7 9-10
Cotton, lb.....	18½	10
Butter, lb.....	26	16
Cheese, lb.....	13½	9

The price of silver from 1868 to 1875 continued at par \$1.29½ per ounce, but from 1885 to 1888, the average price went below 97 cents an ounce. Taking our large crops in the above products of the farm, and any school boy can readily figure out the loss to farmers through the depreciation in the market value of silver by its being demonetized. To illustrate the loss incurred by farmers, we give the following from a letter written in September, 1890, by a London firm that has large dealings with English farmers: "The exchange value of the ruble (silver coin of 75 cents value) to-day is quoted at over 30d, against only 25½d at the beginning of April, and 24½d a year ago. This depreciation of the ruble in Russia quite prevents Russian shippers from fulfilling their engagements, no less than 4s per quarter (eight bushels) having by this means been added to the cost price of wheat since April, while compared with last year, there is a difference of 5s per quarter against the shipper. In other words, at the present rate of exchange, 30s per quarter paid by English buyers represents in the Russian price and measure only about 80 copecks (a copeck is ¼ cts.) per pood (a pood is 36 lbs.), while last year the same price was equal to 100 copecks or one ruble. Thus the Russian producer loses 20 per cent. Two to three years ago, however, the ruble exchange on London was as low as 19d, so that at that time, if 30s per quarter in English money was obtained, it represented 125 copecks per pood. This state of things can not fail to have an effect upon prices, for we cannot have both Russia and the Atlantic ports holding back their wheat for any time without sending up values." If the United States had free coinage for silver, then the Russian ruble would be still higher, as would Indian rupees, a silver coin of about 50 cents legal tender value. In paying for Indian wheat, etc., English buyers either do so in Indian council bills or in rupees, which they buy in gold on the basis of the market value of silver.

Manufacturers and Employers.

An organization of the Manufacturers and Employers of California was perfected last month, as was stated in the PRESS at the time, and the secretary of the board now announces that the membership is sufficient to insure the success of the association. It is the intention to invite every employer of labor to join before October 1st, but after that time 60 day's notice will be required.

In a circular issued on the 10th inst., it is announced that the association has been recently formed for the purpose of promoting the business industries of the Pacific coast, and with the belief that by unity of action and purpose employers can the better withstand the tendency of "trade unions to impose unjust and ruinous exactions."

The declaration of principles of the association is as follows:

"This association is formed to promote the manufacturing interests of the Pacific coast. Its policy is not dictated by a spirit of aggression, but it shall be the earnest endeavor of its members to prevent friction, and to peacefully settle all disputes that may arise between employer and employee."

"We, the members of this association, have no wish to interfere with the indisputable right of labor to organize, but believe that the organization and the federation of labor compel the organization and federation of employers of labor, to the end that neither party shall tempt the other to overstep the bounds of right, reason and justice."

"We believe that the arbitrary spirit shown by the unions in the absence of any effective restraining power, and the frequent strikes and boycotts which have, in consequence, prevailed in this community, are dangerous to its industries, and this association of employers is formed to check these growing evils."

"We recognize the right of labor to organize in its own defense or to ameliorate its condition, and we, as employers, will not trespass on that right by refusing employment to any one because belonging to such labor organization; but we reserve to ourselves the right to decide as to whom we shall or whom we shall not employ."

Coast Coal.

The opening up at Carmelo Bay, Monterey county, of a bituminous coal mine, is causing renewed attention to the coal fields in this State. This bed gives promise of a large supply of steam coal. Something over 200 tons of the coal sent to this city and tested for steam purposes gave much satisfaction, and under the favorable results obtained more energetic measures will be taken not only to thoroughly develop the mine from which the shipments came, but open up other mines in the vicinity.

Although California is the pioneer coal producer on this coast, yet the coal mined has never stood high, owing to its being mainly lignite and of a poor quality at that. The first coal mined in this State was at Mt. Diablo, Contra Costa Co., in 1852, but it was eight years thereafter, or in 1860, before the mines there were opened out so as to be large producers. Several other districts have been since more or less developed, bringing the total product of the State to about 125,000 tons in 1890.

Owing to our large dependence on foreign and up coast coals, more interest is being manifested in the subject of an adequate fuel supply for the increasing demands of the State, which has resulted in more determined and well-directed research. This research has been largely stimulated by constantly improving inland transportation facilities, and also steadily growing local fuel requirements in many parts of the State. There are many persons who keep well informed on coal mining in this State, who are free in expressing their belief that judging from recent discoveries of coal beds in various sections of the State, the time is not far distant when California will cease to be so largely dependent upon foreign coals for its requirements.

NEW OREGON CAMP.—Geo. A. Dysou, postmaster at Brownsville, Oregon, writes us as follows: We have a new camp on the head of this creek here, or, at least 40 miles from here, known as the Calepovia and Bine River District. The Poorman Co., have a tunnel on about 240 feet, and have just erected a small prospecting mill, but as yet, have failed to make it pay, owing to the plates being poor and the screens too coarse, so gold can be panned out of the tailings. There is no road yet, and everything has to be packed in on horses, some seven or eight miles. The ledge is a large

one being 20 to 25 feet wide and the drift is now on black decomposed quartz showing free gold, but very fine. I have been on this coast some 30 years on various camps in California, Nevada and Idaho, including eight years on the Comstock, and consider this new camp very promising, as there are lots of leads and a great supply of wood and water. The only drawback is that there are no roads, and capital has not yet come to the assistance of the miners.

Returned as Agricultural Land.

We recently stated in the PRESS that Acting Secretary Chandler, of the Department of the Interior, had made a new ruling in which he holds that in order to defeat agricultural entry on the ground of mineral character of land, it must be shown that the mineral was known to exist at the time of entry. Heretofore the practice has been to cancel agricultural entries where mineral was discovered at any time prior to issuance of patent. The ruling is a very bad one for the mining interests. Half the time people do not take the trouble to inquire as to the mineral, or prove its presence, unless some one tries to "gobble" the land as agricultural by making entry of it. Under this ruling it is useless to protest. This is "Department law," not "Congressional law," and the miners' rights are disturbed by some ephemeral official.

A self-explanatory comment on this "agricultural and mineral land question" is given in the annexed paragraph from the Yreka (Siskiyou Co.) *Journal*: "Several men and boys are usually engaged in working the bed of Cottonwood creek, at the Old Dave Horn ranch, Hornbrook, sold some years ago to the railroad company, and make from \$2 to \$5 and \$6 a day with rookers. The workers sort out around like a crowd working in the ruins of a fire, without taking up claims, from the fact that no claims would be recognized, the land having been returned as agricultural land many years ago, and so recognized at the Land Office. As long as the miners work harmoniously, there will probably be no trouble; but if they quarrel, all will be fired out in short order. This crowd will probably take out between five and ten thousand dollars before the winter rains stop working in the creek bed, which has to be dug up as deep as 15 feet in some places to reach bedrock."

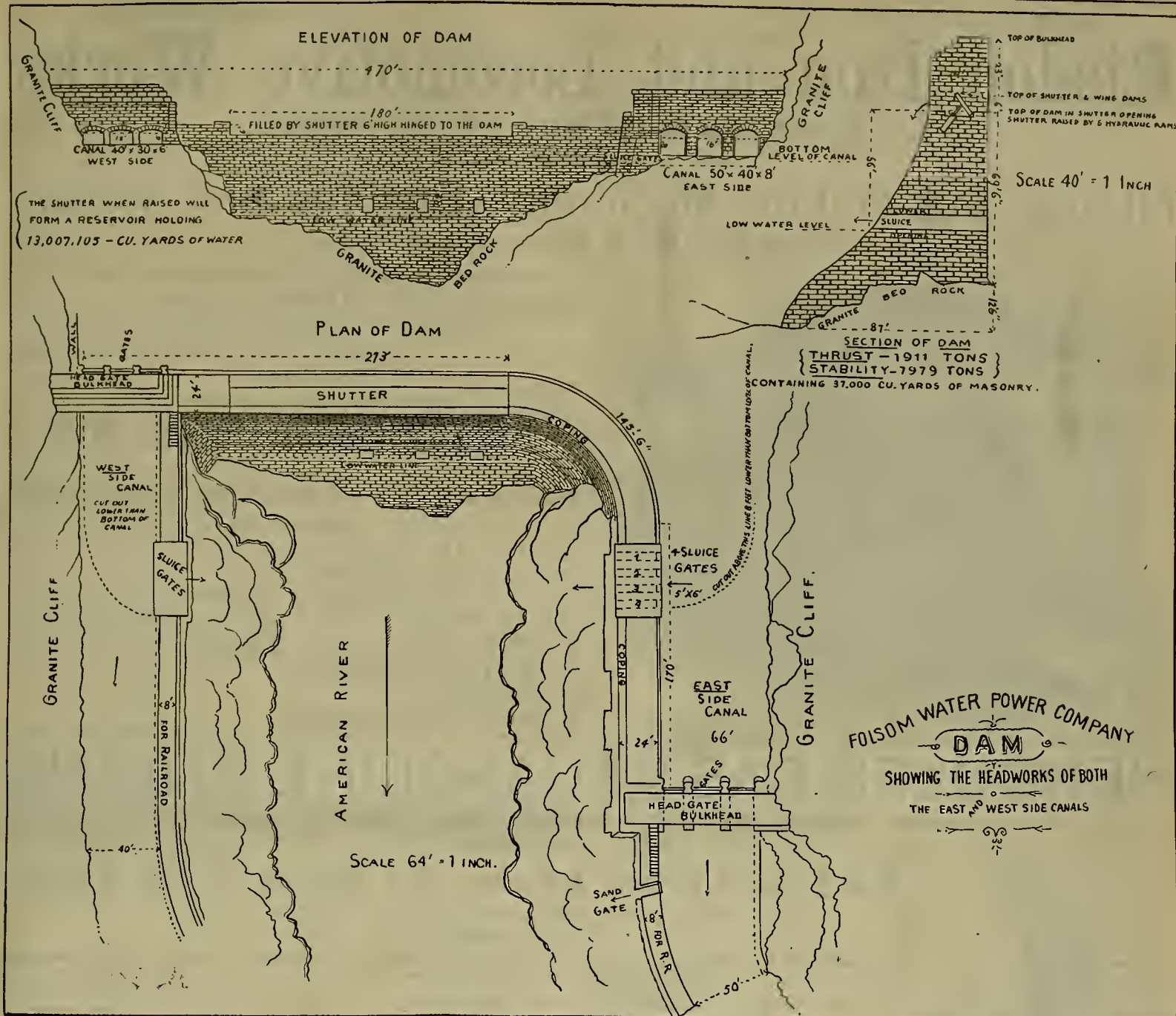
MINING SUIT.—M. W. Fox has filed another suit against the Directors of the Savage mine, and, as in a previous suit, Fox charges that the defendants have entered into a conspiracy with certain milling companies in Nevada whereby the ores taken from the mine are reduced so as to leave about 50 per cent of gold or silver in the waste tailings. These tailings, it is asserted, the defendants caused to be worked over to their own advantage, thus entailing a fraud upon the plaintiff and other stockholders. The prayer of the complainant is for a permanent restraining order and for \$500,000 damages.

MEXICAN TARIFF.—Under the new Mexican tariff, machinery for industrial use, agricultural, mines and cars, is to be free of duty when it is not arranged to be moved by crank or pedal; if so arranged, it is to pay five cents. Tools are reduced from 10 cents to 5 cents; steel ingots reduced from 5 cents to 3 cents; pig iron reduced 1 to 3 cents, and bar iron 5 to 10 cents, according to quality; angle iron will be 3 cents, sheet iron and corrugated iron, galvanized or not, 4 cents; iron beams will remain at 1 cent; manufactures of iron, not otherwise specified, will be increased from 20 to 25 cents.

PINE NUT.—Reports from Pine Nut are to the effect that Zirn has struck a silver vein four miles from his other claim, the Bank of California. Numbers of men are still going from Carson to the Pine Nut mines. The Pine Nut and the Monarch Cons. claims, both, have men at work.

INDISPENSABLE.—The Coronado Foundry and Machine Co., Coronado, San Diego Co., in renewing their subscription, write us as follows: "We find the MINING AND SCIENTIFIC PRESS becoming indispensable and get a great deal of information from it."

ALUMINUM BEARING CLAY is reported as having been discovered by Capt. George Alsworth at Redondo Beach, Los Angeles Co.



The Folsom Dam.

(Continued from page 177.)

for the convict labor, a water power to be developed in the Prison-yard, where the State is now huddling a power house to utilize this power. Six powerful water-wheels, and other machinery has all been provided, and is on the ground. The wheels are 87-inch Lefel turbines, No. 2 "Special."

The work below the prison is simply excavation, considerable of which work has already been done. A broad-gauge railroad, belonging to the Folsom Water Power Co. extends along the outer bank of the canal from the dam to the town of Folsom, where it is connected with the general railroad system of the State.

There has been expended on the work by the Folsom Water Power Co. and by the State of California, more than half a million of dollars. The benefits to spring from its completion are both of a public and private nature.

The erection of this dam has formed a "still-water basin" about three miles long in this section of the river above the dam. Under franchises from Sacramento and Placer county the American River Land and Water Co. has built across the river a heavy timber boom, supported by three massive granite masonry piers, each upward of 50 feet high and 50 feet wide on the base. They have erected a saw-mill at the boom, and float down the river to the mill large quantities of logs from their forest properties on lands on the upper branches of the river. Careful and complete estimates show that on these lands there is now standing upward of 360,000,000 feet of pine lumber, which, by the river and the boom, can be brought at great profit to market. This is but

a portion of the timber land so located tributary to the boom.

The Folsom Water Power Co., foreseeing that, upon the completion of their canal, during a portion of the year all the water of the river could be diverted from the river bed, obtained more than 20 years ago the right to mine the river bed, and said right is protected by U. S. patent. This right they have protected jealously, and so soon as the first section of the canal is finished they will be able to commence such mining.

One of the engravings shows an elevation of the east side bulkhead while being constructed, by which the massiveness of the structure can be understood. It is now 18 feet higher than the cut shows it. The water is drawn from this to the power house, and drops 7.33 feet, where it is utilized on the Lefel turbine wheels for power at the prison. After leaving the wheels, it passes into the canal and flows on to Folsom. The contract with the company is that the State furnishes all the labor required to complete the work down virtually to Folsom, and this is given in payment for the land on which the prison is built and the perpetual use of the power, with certain other privileges. The power will be used at the prison for pumping, lighting and the jute-mill.

The power-house in which the wheels are to work is built of stone, and the walls are now up. The wheels are in place in their concrete arches ready for the water. These wheels are very large, and it took three flat-cars to bring the six wheels from the East.

The irrigation feature is an important one in this plan, as may be imagined when it is stated that water can be delivered to between 400,000 and 500,000 acres of land. It was at first

thought possible to supply water to some 200,000 acres, but special surveys have been made, extending over many months, and it has been ascertained that the canals extending from this dam will deliver water to a much larger area than was originally apposed. The area will include all that region between the Cosumnes and American rivers on the north, and the American and Bear rivers on the south, extending in fact, to within two miles of Wheatland in Sutter county.

It is the intention to utilize the waters of the American river by storing them in immense reservoirs during the months of most copious flows, and distributing them when needed. All of this water has been going to waste. The ordinary common barley and wheat producing land can then be made to yield fruits, etc. All the land will naturally be greatly enhanced in value by being available for irrigation. Other companies will attend to the distribution of this water on the lands. There is plenty of water; it only needs to be conserved and distributed.

The development of the timber and inner interests of the immense timber regions of the upper waters of the American river will give an excellent source of income to the company. Saw-mills, sash, door and blind factories, will be built at the dam and on the railroad. The river mining plan contemplates work in a mile and a half of the bed of the American river, which will be laid bare. There will be plenty of water power for heavy hoisting, as necessary in river mining.

The Folsom Water Power Co. (the offices of which are in this city) will carry the water to Folsom, where the principal power will be developed. A cable will be extended from this

point to Sacramento, 18 miles, and electric power furnished in quantity to that city for light and power. The capital city will be enabled to have all the electric power it needs when the plans of this company now being perfected are carried out.

The granite for building this dam is taken from the banks of the river on the spot. It is first-class material in every respect. It is used not only in the dam, but in the bulkheads, houses, etc.

The original foundation of this dam was laid as far back as 1866. In 1886 the new foundation of the present structure was laid on the old foundation, and the dam was finished in 1891. The entire works can now be completed so as to make a large portion, if not all, of its power available early next year. The dam is a splendid one, but had to be made very strong. The river is one that sometimes rises as much as 60 feet in a few hours, and in flood times is a torrent of magnitude. From the crest of the dam to the level of the water below (as shown in the engraving on the first page), the water falls about 57 feet. The engravings show the headworks of both the east and west side canals, plan and elevation of the dam, with section, etc. This is the most important water-power plant in the State or on this Coast. The fact that electricity will also be generated on a large scale, and distributed for power to the Capital city of California, gives an added interest at this time, when the transmission of power by electricity is attracting so much attention.

The Fresno Edison Electric Light and Power Company has ordered a 200-horse power holler and a compound cut-off engine for the new plant, which will be in operation in October.

WM. H. TAYLOR, President.

R. S. MOORE, Superintendent.

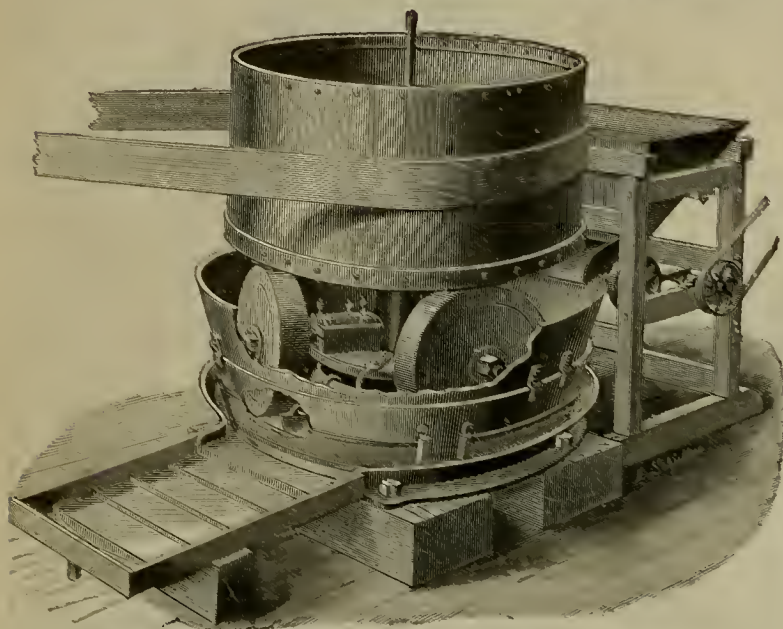
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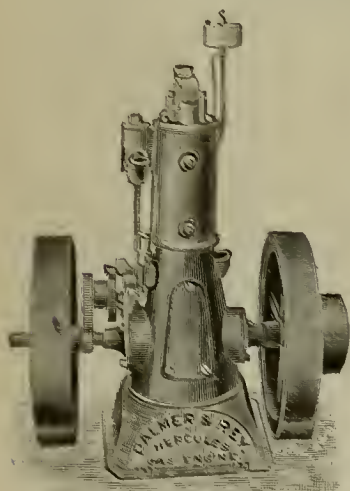
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING SEPT. 8, 1891.

- 439,245.—BOTTLING APPARATUS.—U. Bachmann, S. F.
 450,246.—ANT-EXTERMINATOR.—M. Barthel, San Jose, Cal.
 450,247.—SELF-HOISTING MECHANISM.—Geo. Biddall, Woodland, Cal.
 450,248.—ARM REST.—F. A. Brooks, S. F.
 450,249.—VEHICLE WHEEL.—John Driver, San Leandro, Cal.
 450,250.—CAR COUPLING.—W. H. Garlock, Seattle, Wash.
 450,251.—WALL PROTECTOR AND FENDER.—Milton Hall, S. F.
 450,252.—PLANE.—J. K. Kendrick, Germano, Cal.
 450,253.—SPARK-ARRESTER.—P. M. Low, East Portland, Or.
 450,254.—FOOT SUPPORT FOR WOOD-CHOPPERS.—O. Mosier, Buckley, Wash.
 450,255.—OPERLESS GAS STOVE.—W. B. O'Connor, Stockton, Cal.
 450,256.—OBSTETRICAL DEVICE.—L. Q. Thompson, Mekelunne Hill, Cal.

The following brief list by telegraph, for Sept. 14, will appear more complete on receipt of mail advices:

- California.—William Cameron, Millipitas, Impalement trap; Alexander N. Chalmers and J. R. Wallace, S. F., pump for planers or other machines; Andrew Fraser, assignor to Kieckhefer Iron Works, S. F., ore concentrator; Joseph Herring, Pomona, fruit-gatherer; Theron H. Lark, St. Helena, assignor of one half to W. A. McKenzie, Napa County, wagon-tongue support; Mark P. Madden, Coronado Beach, device for tapping mains; Francis M. Mecum, Chico, gang plow; James C. Nicholson, S. F., reversing valve gear for engines; Edwin M. Reese, Santa Paula, ditching machine; Henry Richmond, Santa Cruz, rotary air compressor and pump; August H. Scholz, Holz, assignor to the Kieckhefer Iron Works, S. F., ore crusher; John T. Smith, S. F., oiler; Archibald W. White, San Jose, pump; Oregon Robert Bruce, Penitentiary, halter; Jonas D. Henry and W. E. Wood, Portland, feed-mill; Washington—Joseph Lanauer, Spokane Falls, mail-bag; John Sampson, Walsburg, chum.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and For-

out of place or shape when the tender is pressed forcibly against any wall or substance.

SELF-HOISTING MECHANISM.—George Biddall, Woodland, Yolo Co. No. 450,247. Dated Sept. 8, 1891. This invention relates to that class of lifting mechanisms in which the operator, by means of a suitably arranged tackle, raises himself to various heights to perform any work desired. The object is to provide a device adapted in the use of picking fruit and pruning trees. A standard or post is supported on a base-frame, and on this is a sliding seat. The operator takes his place upon the seat, and pulling on the hoisting rope, raises the entire seat-frame and himself. In this upward movement, a pawl or dog slips freely by the teeth of a rack so that he has not to attend to this pawl or dog, but simply to the exertion of his power, resulting in lifting himself to the point desired. When he has reached this point, he has only to relieve the rope, when the pawl will engage the rack. In coming down, he beats the pawl out and slacks on the rope. This device can be readily transported from tree to tree in an orchard, is very stable and not liable to rock or get out of order. A fruit-basket or bucket may be attached to the seat to hold the fruit that is picked.

ANT-EXTERMINATOR.—Michael Barthel, San Jose. No. 450,246. Dated Sept. 8, 1891. In a former patent issued to the same inventor a box was shown having holes upon the opposite sides, a poisonous compound placed within the box and an absorbent material arranged in contact with the compound for the purpose of keeping it in a moist condition. In the present invention, the box is so constructed that the inventor is enabled to dispense with the moistened absorbent material and to retain the compound in its properly moist condition for use without the use of the absorbent material. A compound attractive and fatal to the ants is placed in the box, and it is carried away and stored in their nests to be eaten and fed to the young, the tribe being thus destroyed without getting into food and other articles.

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necessary to rivet it to the hoop. It will fit the circle of any tank regardless of size, and is particularly adapted to large mining, water or wine tanks. The engraving shows what a very simple device this coupling is.

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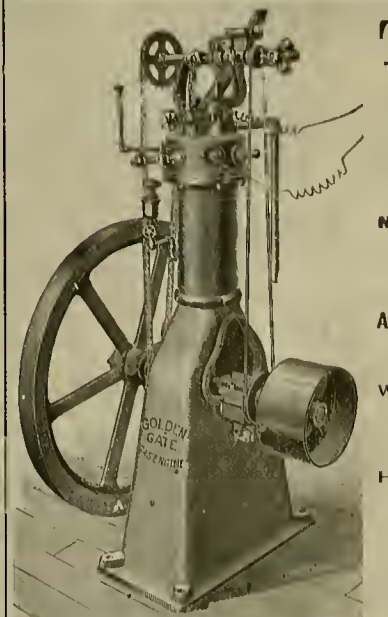
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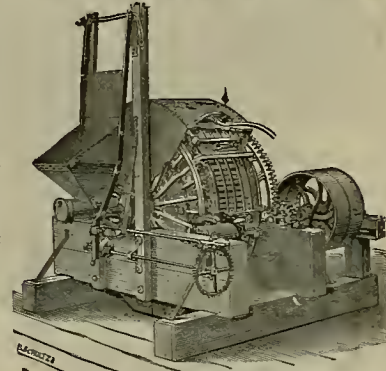
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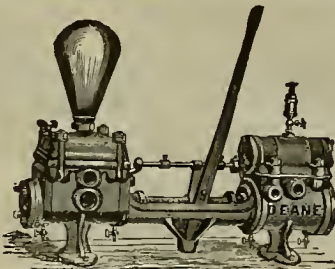
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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bul-
-ion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

**FRASER & CHALMERS,
MINING MACHINERY**

CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Harz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Silice Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

**IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❖ BOILERS ... AND SECTIONAL ...
IMPROVED STEAM STAMPS**

Hoisting Engines,
Safety Cages,
Safety Hooks,

ORE CARS, WATER & ORE
BUCKETS,

Air Compressors,
Rock Drills, Etc.

GENERAL MILL AND
MINING SUPPLIES, ETC.

Sectional Machinery
FOR
WULE-BACK
TRANSPORTATION.



Pumping Engines
and Cornish
Pumping Machinery,

IMPROVED
WATER JACKET

Blast Furnaces for
Galena & Copper Ores,

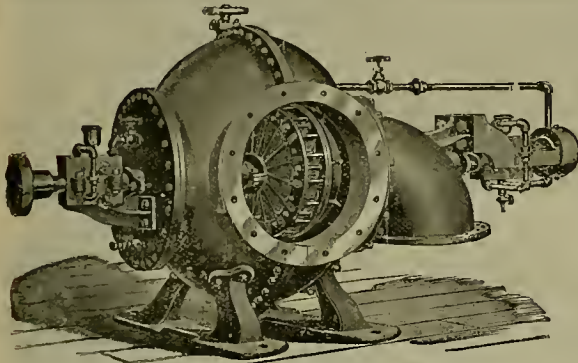
SLAG CARS AND POTS,

Roots & Baker
Pressure Blowers,

SUSPENDED
TRAMWAYS.

General Offices and Works: **FULTON AND UNION STS., CHICAGO, ILL.**

BRANCH OFFICES: NEW YORK, Room 43, No. 2 Wall St. DENVER, COLO., 1316 Eighteenth St. SALT LAKE CITY, UTAH,
7 W. Second South St. LONDON, ENG., 43 Threadneedle St., E. C. CHIHUAHUA CITY, MEXICO, No. 11
Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.
HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. 4 North Main St.
SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



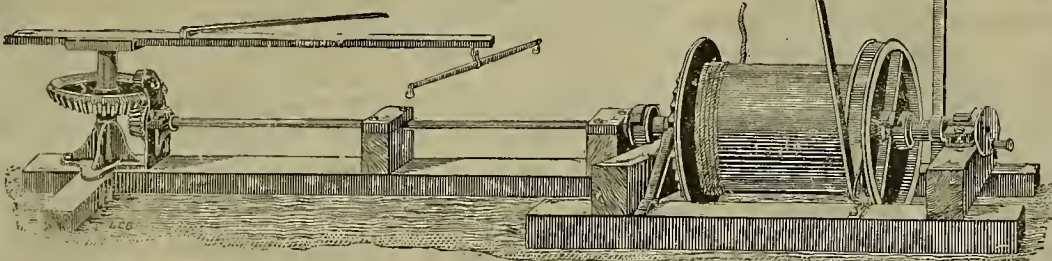
**JAMES LEFFEL'S
Mining Turbine Water Wheel.**

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.
Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.
Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.
FRASER & CHALMERS, General Agents,
Chicago, Ill., and Denver, Col.
PARKE & LACY CO., General Agents, San Francisco, Cal

KROGH'S MINING HORSE-POWER HOIST

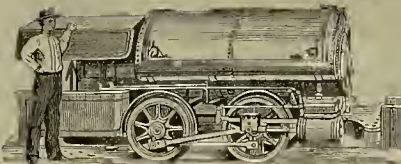
Is known to be the
Best Horse-Power
Hoist now made.
It is strong and
durable.
The drum will
carry 1000 feet of
five-eighths steel
rope. It can be
used to run a
pump or blower,
in conjunction
with hoisting.
Manufactured by
**F. W. Krogh
& Co.,**
51 BEALE ST.,
San Francisco.



BALDWIN LOCOMOTIVE WORKS.

ANNUAL CAPACITY 1000. ESTABLISHED 1831.
LOCOMOTIVE ENGINES!

Adapted to every variety of service, and built accurately to standard gauge and templates. Like parts of different engines of same class perfectly interchangeable.
Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.



COMPOUND LOCOMOTIVES
BURNHAM, WILLIAMS & CO., Proprietors, Philadelphia, Pa.



QUARTZ SCREENS
A specialty. Round, slot or hurred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron.
Zinc, Copper or Brass Screens for all purposes. California Perforating Screen Co., 145 & 147 Beale St., S. F.
DR. LA GRANGE, OCULIST,
Office, 215 Powell St., San Francisco.
Hours from 11 until 2. Residence, 1432 Geary St., cor. Laguna. Hours from 3 until 5. All Diseases of the Eye successfully treated by his new system without the use of the knife.
DEWEY & CO., 220 Market St., S.F. Patent Agents.

THOMAS PRICE & SON,
Assay Office, Chemical Laboratory,
BULLION ROOMS and ORE FLOORS,
524 Sacramento Street, San Francisco, Cal.

COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.
Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

**SELBY
SMELTING and LEAD CO.,**
416 Montgomery St., San Francisco

**GOLD AND SILVER REFINERY
And Assay Office.**

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

MANUFACTURERS OF...
**BLUESTONE,
LEAD PIPE,
SHEET LEAD,
SHOT, Etc., Etc.**
ALSO MANUFACTURERS OF
Standard Shot-Gun Cartridges,
Under Chamberlin Patent.

JOHN TAYLOR & CO.,
IMPORTERS AND DEALERS IN
**ASSAYERS' MATERIALS, MINE
AND MILL SUPPLIES,**

LSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.
63 & 65 First St., cor. Mission, San Francisco

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.
Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennison's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
JOHN TAYLOR & CO.

Nevada Metallurgical Works.
NO. 28 STEVENSON STREET,
Near First and Market Streets, S. F.
C. A. LUOKHARDT, Manager. ESTABLISHED 1879

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations Mines; Plans and Reports furnished.
C. A. LUOKHARDT & CO.,
(Formerly Huhn & Luckhardt,
Mining Engineers and Metallurgists

**GREAT REDUCTION!
BATTERY SCREENS.**
Best and Cheapest in America.



PENONATED SHEET METAL
For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.
Inventor and Manufacturer of the celebrated Slot Cut or hurred and Slot Punched Screens.
Mining Screens a specialty, from No. 1 to 15 (fine).
Orders promptly attended to.
San Francisco Pioneer Screen Works,
221 & 223 First St., San Francisco, Cal.
JOHN W. QUICK, Proprietor.

W. H. CONLY,
Mining, Commission.

LEGITIMATE INVESTMENTS A SPECIALTY; 331 Pine Street, Room 7, San Francisco; Telephone No 5067.

TUBBS CORDAGE CO.
(A Corporation.)
Constantly on hand a full assortment of Manila Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
611 & 613 Front St., San Francisco, Cal.
INVENTORS, TAKE NOTICE!
L. PETERSON, MODEL MAKER.
258 Market St., N. E. cor. Front (up stairs), San Francisco
Experimental machinery and all kinds of models, Tin and brasswork. All communications strictly confidential.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 17, 1891.

The general market does not present any new features deserving particular mention. Iron workers and manufacturers are, as a rule, well provided with orders. The money market continues to show signs of ease under freer remittances from the interior and only a moderate call for funds for speculative purposes. The rapidity with which wheat is being exported gives assurance of more general ease in the money market by the last of the year than for several years. That already exported represents a value to farmers of \$3,000,000, and the ships in port loading wheat will take out fully \$1,500,000 worth (farm value), while there is to arrive under charter for wheat-loading ships that will take out over 425,000 tons of wheat, which at \$30 on the farm will amount to nearly \$13,000,000; and as this grain will be mostly dispatched before January, 1892, it will be available that still larger sums of money will soon be available. It is this general ease in the money market through disbursements to farmers that will undoubtedly give a decided impetus to all kinds of business. As the above only represents disbursements for wheat, when that made on barley, hay, fruits, etc., the total will be about doubled.

QUICKSILVER—Receipts the past week aggregate 237 flasks. There was shipped overland in last month about 30 flasks. The market is strong at full figures in sympathy with a higher market abroad.

MEXICAN DOLLARS—There was exported the past week the following sums: To China, \$25,973 and to Japan \$13,500. The market is fairly steady at about 77 1/4 cts.

SILVER—The market has been slowly falling in London and also in New York. As the Mint has purchased the monthly requirements of 4,500,000 ounces for September, it will not be in the market until Oct. 2d, and in the interim speculators can knock prices to still lower figures. It can no longer be doubted that the silver markets of the world are under a strong moneyed pool, formed for the purpose of speculating in the certificates on the New York market. It looks very much as if the pool had sold large quantities of the certificates at much higher prices, and are now doing all in their power to break the market, so as to get back their sales at lower figures. Silver has become more of a gamble than ever before, and in making it so the market value of many commodities governed by that of silver, is made to fluctuate as the pool desires.

BORAX—The overland shipments in August aggregated 6748 cts. There was exported by sea in last week, 2013 cts to New York. The market appears to have a firmer tone.

LIME—Receipts the past week aggregate 3359 bbls. The market is steady, with, it is said, more being used for fertilizing.

LEAD—The market is fairly strong at full figures.

TIN—In our market there is absolutely nothing to report. The East reports a slack demand. European advices report the market somewhat uncertain, but with the tendency to a return to a normal condition by the turn of the year.

COPPER—The market is gaining slightly in strength, with an advance in quotations received from New York. European advices indicate the market working into better shape for sellers. In their monthly circular, James Lewis & Sons, Liverpool, reports as follows: A material reduction in the consumption of Argenteiferous Copper Matte has been caused by the almost complete cessation of the manufacture of sulphate of copper, pending the absorption of the large stocks resulting from the overproduction of the last and the early part of this year. American consumers have for some time past only supplied their immediate requirements, and consequently hold little, if any stock; it is therefore expected that they will require large quantities during the autumn months, leading to a considerable advance in price, as, owing to the large shipments to Europe, and continued stoppage of the Anaconda mine and works, the available supplies are much reduced.

COKE—Imports the past week aggregate as follows: Cardiff 684 tons, Newcastle, Eng. 1179 tons; total 1863 tons. The market is reported easy.

COAL—Imports the past week aggregate as follows: Kobe 2500 tons, Coos Bay 800, Newcastle, N. S. W. 5596, Carmelo Bay 200, Departure Bay 5180, Cardiff 502, Baltimore 2840, and Seattle 2270; total 20,888 tons. The market is weak for cargoes in all positions. Many large consumers are not disposed to anticipate their wants unless offered concessions. It now looks as if the market will see still lower prices before it advances any on present quotations.

Eastern Metal Markets.

By Telegraph.

New York, September 17.—The following are the closing prices the past week:

	Silver in Silver	London, New York, Copper.	Lead.	Tin.	
Thursday	45-16	95 1/2	12 30	4 47 1/2	20 05
Friday	45-16	95 1/2	12 30	4 47 1/2	20 00
Saturday	45-16	95 1/2	12 30	4 47 1/2	20 00
Sunday	45-16	95 1/2	12 30	4 47 1/2	20 00
Monday	45-16	95 1/2	12 30	4 47 1/2	20 00
Tuesday	45-16	95 1/2	12 30	4 47 1/2	20 00
Wednesday	45-16	95 1/2	12 30	4 47 1/2	20 00

Quicksilver shows no activity at hardening prices. Borax is strong at a slight advance. Copper shows a steady, strong tone. Lead and tin are firm. The demand is only fair.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done to all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their Scientific Patent Agency (B room week to week and year to year.

MINING AND SCIENTIFIC PRESS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

COMPANY AND LOCATION.		NO.	AMT. LEVIED.	DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co., Nevada.	42.	50c.	Aug 4, Sept 7, Sept 23.	C. L Perkins.	331 Pine St	
Brunswick Cons M Co., California.	2.	2c.	Sept 11, Oct 3, Nov 15.	J Stadfeld, Jr.	308 Montgomery St	
Challenge Cons M Co., Nevada.	9.	50c.	July 31, Sept 2, Sept 23.	C. L McCoy.	331 Pine St	
Golden Piece Gravel M Co., Cal.	15.	45c.	June 30, Aug 12, Sept 19.	W. J. Gleason.	Phelan Block	
Gray Eagle M Co., California.	23.	1c.	Aug 12, Sept 14, Oct 6.	C. W. Barrows.	303 California St	
Imyo Marble Co., California.	14.	10c.	Aug 21, Oct 5, Oct 23.	G. W. Luce.	137 Montgomery St	
Julia Cons M Co., Nevada.	24.	10c.	Aug 16, Sept 16, Oct 8.	T. S. Stadfeld.	309 Montgomery St	
Locomotives M Co., Arizona.	21.	5c.	Sept 1, Oct 5, Oct 24.	A. H. Fish.	369 Montgomery St	
Martin White M Co., Nevada.	26.	25c.	July 11, Aug 14, Sept 21.	A. B. Cooper.	325 Montgomery St	
Mexican M Co., Nevada.	43.	25c.	Aug 10, Sept 14, Oct 6.	C. E. Elliott.	308 Montgomery St	
Motta Christo M Co., Nevada.	5.	25c.	Aug 17, Sept 23, Oct 14.	L. Leavitt.	533 Kearny St	
New El Dorado G M Co., California.	2.	1c.	Aug 4, Sept 10, Oct 2.	J. W. Pew.	310 Pine St	
North Belle Isle M Co., Nevada.	18.	25c.	Aug 23, Oct 2, Oct 20.	J. W. Pew.	310 Pine St	
North Gould & Curry M Co., Nevada.	12.	15c.	Sept 1, Oct 2, Oct 13.	C. H. Mason.	331 Montgomery St	
Scott & Bar M Co., California.	10.	25c.	Aug 29, Sept 20, Sept 21.	H. Pink.	309 Montgomery St	
Silver King M Co., Arizona.	7.	20c.	Aug 18, Sept 24, Oct 27.	J. W. Pew.	310 Pine St	
Teresa M Co., Mexico.	5.	40c.	Aug 11, Sept 14, Sept 30.	A. Cheminant.	320 Montgomery St	
Union Cons M Co., Nevada.	44.	25c.	Aug 31, Oct 5, Oct 26.	A. W. Barrows.	303 California St	
Weldon M Co., Arizona.	4.	50c.	Aug 25, Oct 1, Oct 22.	A. Waterman.	309 Montgomery St	
Yellow Jacket M Co., Nevada.	43.	50c.	Aug 31, Oct 2, Nov 7.	W. H. Blauvelt.	Gold Hill	

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Evening Star M Co.	J. J. Scoville.	320 Sansome St.	Annual.	Sept 23
Pacific Coast Borax Co., California.	A. H. Clough.	230 Montgomery St.	Annual.	Sept 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co.	T. Wetzel.	320 Sansome St.	10.	Aug 15
Cons Cal & Virginia M Co., Nevada.	A. W. Havens.	308 Montgomery St.	50.	Aug 17
Copple M Co.	E. M. Hall.	314 Montgomery St.	30.	Sept 10
Imperial Marble Co., California.	D. M. Knell.	309 Pine St.	3.	Aug 17
Maydown Gravel M Co., California.	T. J. Mitchell.	330 Pine St.	50.	Aug 20
North Banner Cons M Co., California.	T. J. Mitchell.	Grass Valley.	50.	Aug 20
North Commonwealth M Co., Nevada.	J. W. Pew.	310 Pine St.	25.	June 17
North Star M Co., California.	D. A. Jennings.	401 California St.	50.	Apr 8
Pacific Coast Borax Co., California.	A. H. Clough.	230 Montgomery St.	1 00.	Sept 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING August 27.	WEEK ENDING Sept 3.	WEEK ENDING Sept 10.	WEEK ENDING Sept 17.
Alpha.	70	75	60	55
Alta.	55	60	50	45
Andes.	1.15	1.20	1.15	1.25
Belcher.	1.25	1.30	1.10	1.25
Belle Isle.	.35	.40	.50	.40
Best & Belcher.	3.15	3.60	3.25	3.40
Bullion.	2.75	3.00	2.60	2.80
Bodie Cons.	.60	.70	.55	.60
Bulwer.	.20	.20	.25	.20
Commonwealth.	.50	.50	.50	.50
Cons. Cal. & Cal.	1.70	1.75	1.50	1.60
Challenge.	.90	1.00	.80	.90
Chollar.	2.00	2.10	1.85	2.00
Confidence.	.30	.30	.30	.30
Cons. Imperial.	.40	.50	.40	.50
Caledonia.	.40	.50	.40	.50
Crown Point.	1.55	1.65	1.50	1.65
Crocker.	.05	.05	.05	.05
Del Monte.	.20	.20	.20	.20
Elmer Cons.	.40	.40	.40	.40
Exchequer.	.40	.40	.40	.40
Grand Prize.	.10	.10	.10	.10
Gould & Curry.	1.45	1.75	1.60	1.70
Gold & Norcross.	1.10	1.30	1.10	1.30
Julia.	.15	.15	.15	.15
Justice.	.60	.55	.65	.50
Kestock.	.25	.30	.25	.30
Lady Wash.	.20	.20	.20	.20
Levee.	.20	.20	.20	.20
Mexican.	2.10	2.55	2.10	2.50
Navajo.	.20	.25	.20	.25
North Belle Isle.	.20	.20	.20	.20
Nev. Queen.	.10	.10	.10	.10
Occidental.	.30	.40	.30	.40
Ophir.	3.40	3.75	3.50	3.85
Overman.	1.60	1.75	1.60	1.75
Potosi.	3.35	3.10	3.00	3.25
Peerless.	.10	.10	.10	.10
Savage.	2.15	2.55	2.00	2.40
S. B. & M.	.75	.80	.65	.70
Sierra Nevada.	2.80	3.50	3.00	3.25
Sierra Hill.	.25	.25	.25	.25
Scorpion.	.25	.25	.25	.25
Union Cons.	2.35	2.65	2.30	2.55
Utah.	.75	.80	.75	.80
Yellow Jacket.	1.50	1.70	1.35	1.50

Sales at San Francisco Stock Exchange.

THURSDAY, September 10, 9:30 A. M.	
200 Andes.	1.25
650 Belcher.	1.25
300 Best & Belcher.	3.75
200 Challenge Cons.	1.50
160 Cons Cal & Va.	1.75
100 Cons New York.	1.50
500 Crown Point.	1.50
500 East Best & Belcher.	3.50
150 Exchequer.	.70
150 Gould & Curry.	1.40
60 Hale & Nor.	1.90
30 Iowa.	.35
200 Justice.	.65
100 Lady Washington.	.25
200 Mexican.	2.50
200 North Belle Isle.	.25
200 Occidental.	.40
100 Ophir.	.90
100 Overman.	1.20
100 Potosi.	3.20
400 Savage.	3.05
675 Sierra Nevada.	3.40
100 Silver Hill.	.25
400 Union Cons.	.70
50 Yellow Jacket.	1.45

San Francisco Metal and Coal Market.

THURSDAY, September 17, 1891.	
ANTIMONY.	
Refined, in car lots.	@ 8 1/2
Concentrated, do.	@ 7 1/2
All grades, jobbing at advance.	Toe Calc. 4 1/2
COPPER.	
Bolt.	22 @
Sheeting.	22 @
Ingot, jobbing.	@ 15
Do, wholesale.	@ 14 1/2
Fire Box Sheets.	22 @
IRON.	
Bar, base.	@ 3 1/2
Norway, base.	@ 3 1/2
STEEL.	
Spot, Load, Spot from Yard—PER TON.	
Epilgton.	26 @
Glenn.	27 @
Am. Steel.	28 @
Oregon Pig.	26 @
Puget Sound.	27 @
Bay Lane White.	23 @
Shelby, No. 1.	27 @
Langdon.	25 @
Thorcliff.	25 @
Gardner.	25 @
Garrow.	25 @
Chromite.	25 @
CHROME IRON ORE.	
Per ton.	@ 10
LEAD.	
Pig.	@ 4 1/2
Bar.	@ 4 1/2
Sheet.	@ 4 1/2
Pipe.	@ 4 1/2
SILVER.	
(Discount 1 1/2 on 500 bags)	
Drop, @ bag.	1 90 @
Buck, @ bag.	2 10 @
Onilled, do.	2 30 @
QUICKSILVER.	
By the bag.	41 00 @
Flasks, old.	40 @

NEWSPAPERS that will insert the following will center a favor on a worthy laboring man: To the Lieutenants.

Any persons by the above name, living on the Pacific Coast, are requested to address "Albert," Dutch Flat, Cal.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer county, California. Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 12th day of August, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

NAMES.	No. Cert.	No. Shares.	Am't.
A W Barrows, Trustee.	569	500	\$50 00
A W Barrows, Trustee.	562	500	25 00
A W Barrows, Trustee.	563	500	25 00
A W Barrows, Trustee.	568	1,000	50 00
A W Barrows, Trustee.	569	1,000	50 00
A W Barrows, Trustee.	570	500	25 00
A W Barrows, Trustee.	580	1,000	50 00
A W Barrows, Trustee.	589	500	25 00
A W Barrows, Trustee.	590	500	25 00
A W Barrows, Trustee.	600	300	15 00
A W Barrows, Trustee.	601	200	10 00
S E Brown, Trustee.	267	100	5 00
S E Brown, Trustee.	312	50	2 50
S E Brown, Trustee.	536	515	25 75
O H Bogart, Trustee.	447	5,000	250 00
O H Bogart, Trustee.	448	1,000	50 00
O H Bogart, Trustee.	449	1,000	50 00
O H Bogart, Trustee.	450	1,000	50 00
O H Bogart, Trustee.	451	1,000	50 00
O H Bogart, Trustee.	453	500	25 00
O H Bogart, Trustee.	473	214	10 70
O H Bogart, Trustee.	474	100	5 00
O H Bogart, Trustee.	475	100	5 00
O H Bogart, Trustee.	488	105	5 25
S H H.	520	500	25 00
Wm Loviston, Trustee.	516	5,050	252 00
Wm Rosekrans.	39	600	30 00
Mrs M E Stout.	184	500	2 00
C S Stout, Trustee.	476	2,000	100 00
C S Stout, Trustee.	477	853	42 25
W A Seales.	226	445	22 25
W A Seales, Trustee.	316	1,000	50 00
A Seales, Trustee.	518	1,000	50 00
W Seale, Trustee.	519	600	30 00
J H Turner.	516	50	2 50
J N Taylor, Trustee.	532	1,940	97 00

And in accordance with law, and an order of the Board of Directors, made on the 12th day of August, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on TUESDAY, the 6th day of October, 1891, at the hour of one o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

A. W. BARROWS, Secretary.

Office, Room 11, No. 303 California street, San Francisco, California.

DELINQUENT SALE NOTICE.

NEW EL DORADO GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, El Dorado county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 4th day of August, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Namos.	No. Cert.	No. Sh. rcs.	Am't
W N M rtin, Trustee.	48	20	\$ 1 00
W N Martin, Trustee.	64	20	1 00
W N Martin, Trustee.	60	10	50
W N Martin, Trustee.	73	10	50
J P Stough.	81	5,000	250 00
J P Stough.	82	2,000	100 00
J P Stough.	83	1,000	50 00
J P Stough.	84	1,000	50 00
J P Stough.	85	500	25 00
J P Stough.	86	500	25 00
J P Stough.	87	500	25 00
J P Stough.	88	500	25 00
J P Stough.	89	100	5 00
J P Stough.	90	100	5 00
J P Stough.	91	100	5 00
J P Stough.	92	100	5 00
J P Stough.	93	50	2 50
J P Stough.	94	50	2 50
W O Buckland.	97	100	5 00
J P Stough.	104	13,500	675 00
W N Martin.	107	5	25
W N Martin.	108	85	4 25
John Fern, M. D.	109	100	5 00
John Fern, M. D.	110	100	5 00
John Fern, M. D.	111	100	5 00
John Fern, M. D.	112	700	35 00
F J Locher.	116	50	2 50
F J Locher.	117	50	2 50
W N Martin.	118	100	5 00
W N Martin.	119	100	5 00
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W N Martin.	196	100	5 00
W N Martin.	197	100	5 00
W N Martin.	198	100	5 00
W N Martin.	199	100	5 00
W N Martin.	200	100	5 00

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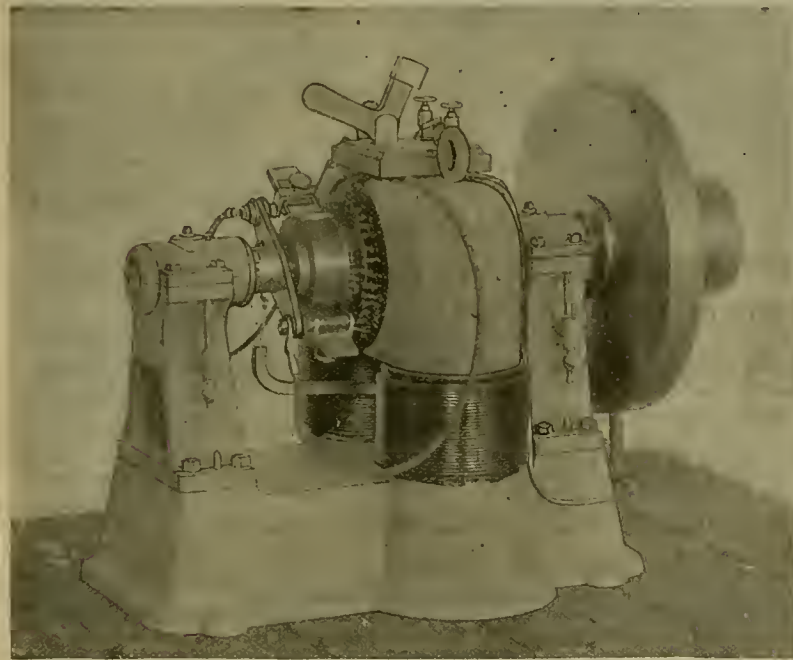
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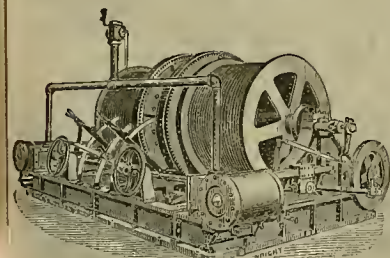
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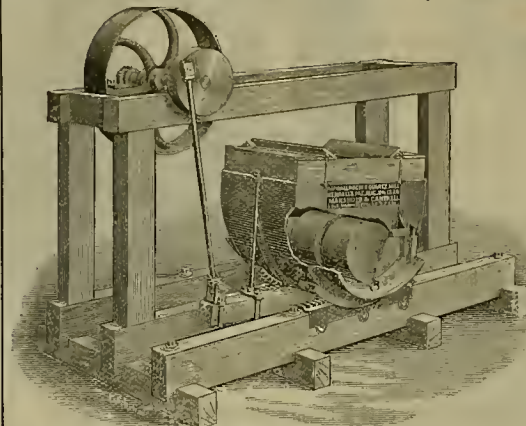
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KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY, 12 Tons in 24 Hours. 3 H. P.

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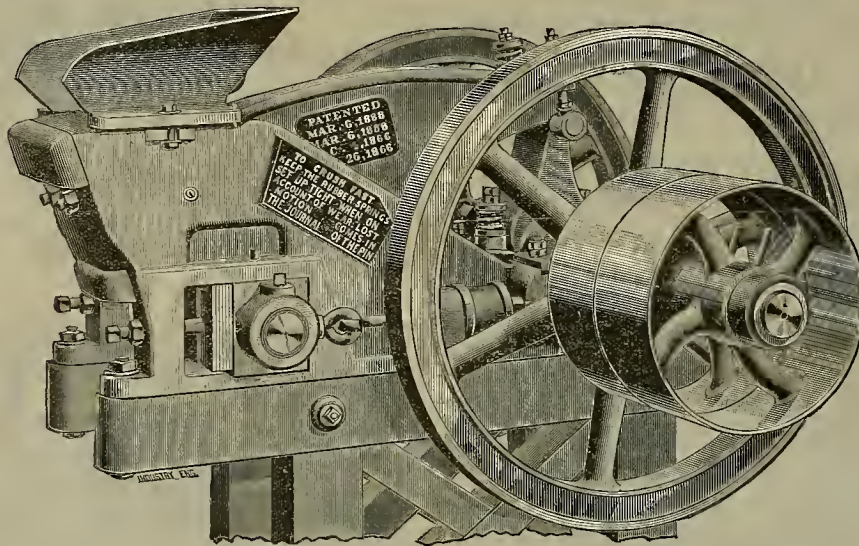
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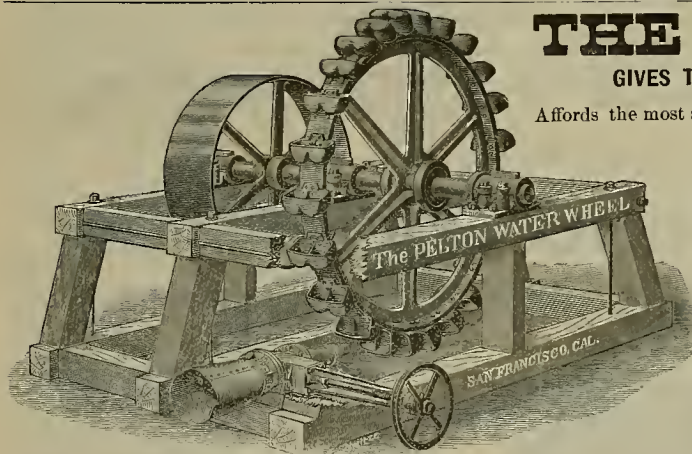
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Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

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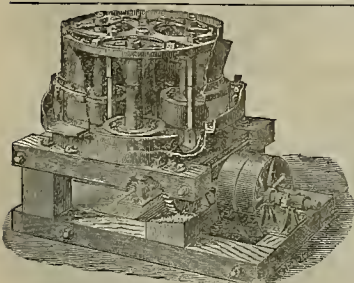
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FRUE ORE CONCENTRATOR

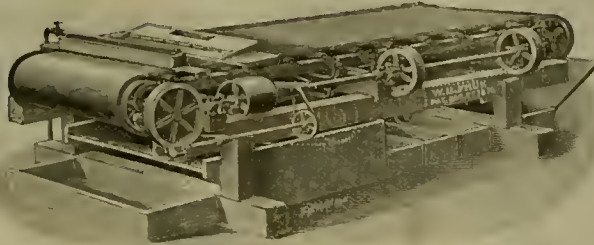
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880;
September 18, 1883; July 24, 1888;
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Price of Plain Belt Frue Vanner, \$575, f. o. b.

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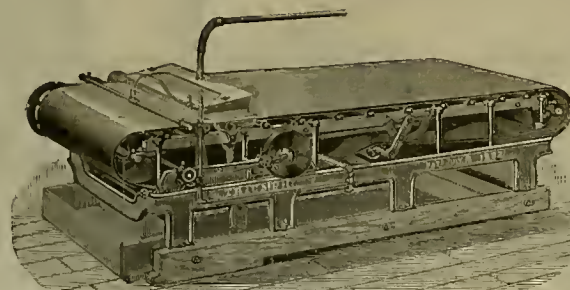
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs," for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.
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We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.
GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

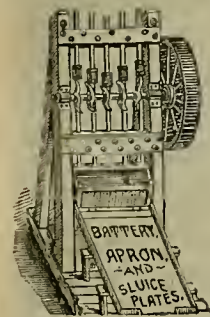
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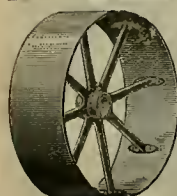
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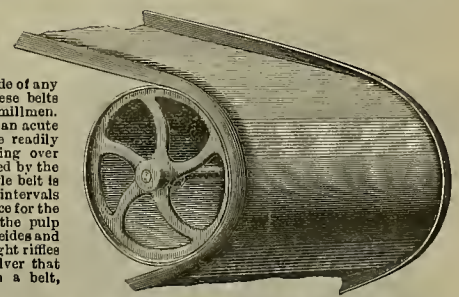
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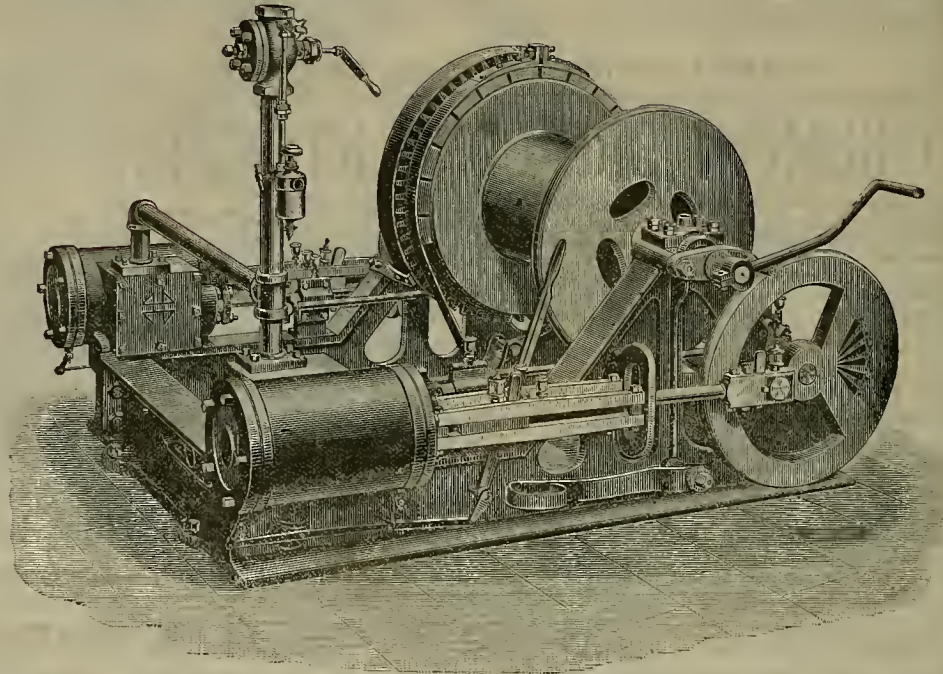
STEAM CAPSTANS AND SHIP WINDLASSES.

Double Cylinder, Single Drum,
Improved

FRICTION HOISTING ENGINE

With or Without Adjustable Foot Brake.

This engine is specially adapted for contractors, railroads, quarries, inclines, small shafts, bridge building, docks, warehouses, lighters, barges, coal yards, ice houses, pile driving and general hoisting, where boiler is detached and connected by steam pipe, or compressed air may be used. They have double cylinders, friction drum and two balanced crank wheels, and, if desired, extra, are provided with adjustable band foot brake, lined with hard maple blocks. Fixtures are same as with single cylinder engines.



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BOILERS, ENGINES, PUMPS AND MACHINERY OF EVERY VARIETY.

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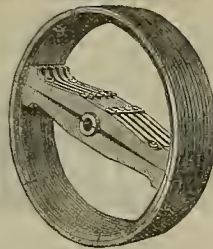
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WATER PIPE, ETC., ETC.

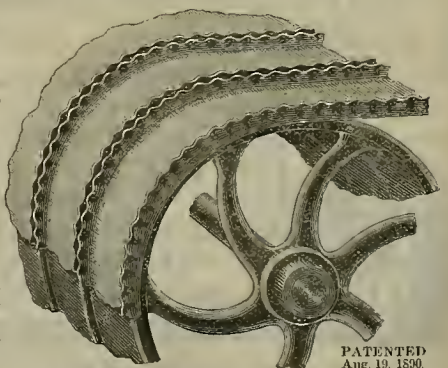
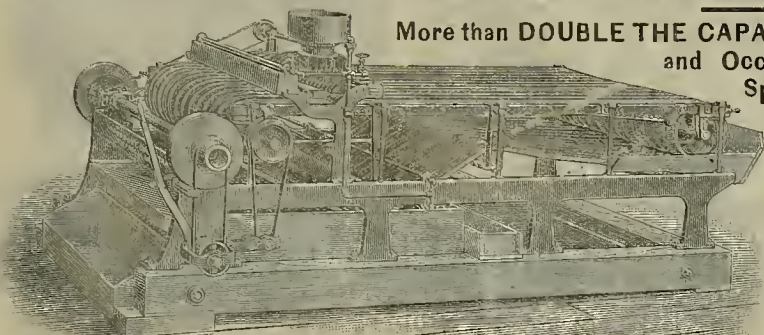
WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS.

More than DOUBLE THE CAPACITY with One-Half Less Power and Occupying Less than One-half the Space of any other Concentrator.

Built of Best Steel and Wrought Iron.
STRONG AND DURABLE.
Price.....\$575 f. o. b.
See for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. This excess in length of material effectively prevents the edges from cracking; plain edge belts have to stretch about one inch to the foot as they pass around the drums. This continuous stretch cracks the edges. The improved belt obviates that difficulty.

GEO. E. WOODBURY, Man'r, 213 to 219 First St., San Francisco.



PATENTED
Aug. 19, 1890.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 13.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 26, 1891.

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SINGLE COPIES, 10 CENTS.

The Heine Safety Boiler.

A dispatch from St. Louis, dated Sept. 21st, says: "The Heine Safety Boiler Co. of this city has contracted with the Broadway & 7th Avenue Cable Railway of New York City to supply them with Heine boilers aggregating 4500-horse power, the boilers to be used in operating their new cable system. This is the type of boiler for which the Risdon Iron Works of San Francisco have recently closed contracts with the Palace Hotel and the San Francisco Gaslight Company."

In this connection it may be stated as a fact of interest that the S. F. Gaslight Co. recently tested their Elephant boilers under the most favorable conditions and the result showed an evaporation of seven pounds of water per pound of Sydney coal. Then they made a test of the Heine patent boiler in use at the Risdon Iron Works and got an evaporation of 12½ pounds of water to one pound of coal.

The engraving given herewith shows the Heine boiler. It consists of an upper shell, two water legs and the water tubes. The shell has dished or rounded heads and forms the steam drum. Near each end of the shell, just inside the heads, on the lower side, it is cut away, making an opening about one-quarter of the circumference in length by 13 inches in width.

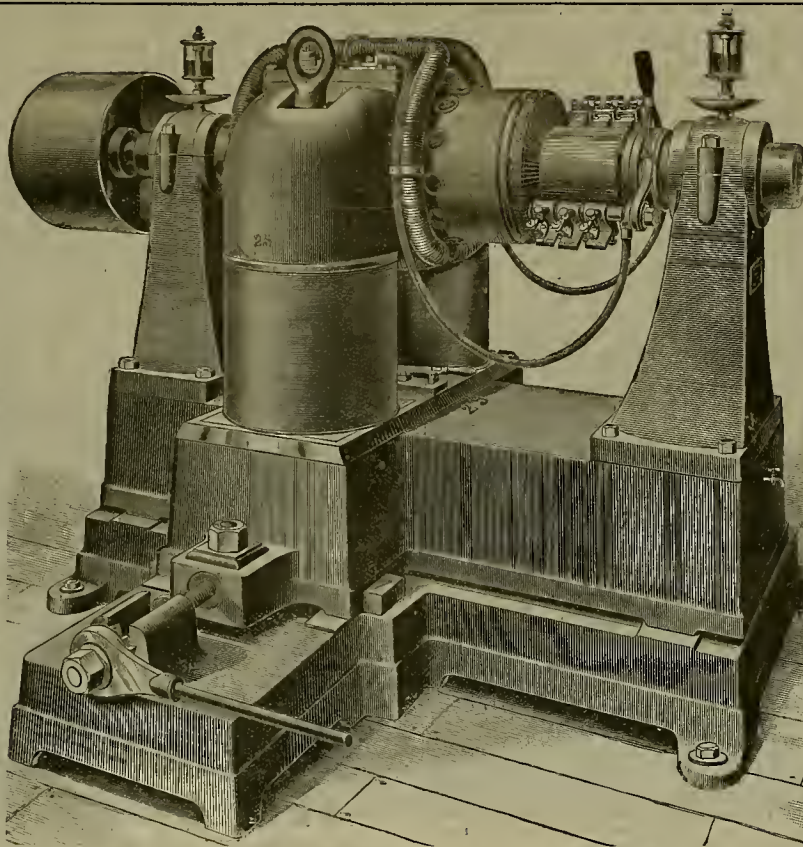
The tubes are 3½-inch lapwelded tubes, extending from water leg to water leg into the inner sheets of each of which (tube sheets) they are rolled or expanded. Opposite each tube, in the outer sheet (head plate) is placed a hand hole, large enough to insert or withdraw a tube in case of renewals. Each hand hole is closed from the inside with a hand-hole plate which, by an ingenious device for locking, can be removed in a few seconds when necessary to inspect or clean the tube. The hollow stay bolts permit the passage of a 3-inch steam nozzle to blow off any soot accumulating on the outside of the tubes.

A mud drum is suspended in the steam drum (near its rear end) 3½ inches above its lower surface and entirely surrounded by boiling water. The feed water is introduced through the front head of steam drum by the pipe entering the mud drum, thus becoming heated as it flows to the rear of mud drum there depositing its sediment, which is blown off through the blow-off pipe, while the clear water eddies over the sides and head of the mud drum which is cut down about one-quarter of its diameter as shown in section. A supplementary blow-off cock is provided in the base of the rear water leg.

The water column, with gauge glass and cocks, steam gauge, steam valve and safety valve are also attached to the front end of boiler, thus placing all appliances for safety and control at one convenient point.

Light firebrick tiles, resting on the upper and lower rows of tubes (see section) form flues around the tubes which are thus suspended in the heated gases, which sweep along their entire length making three turns to the breeching, which they reach usually with about 400 deg. F. temperature, thus showing the completeness with which the heat is utilized by the boiler. The breeching may be placed at front or rear end of boiler as circumstances may require.

The boiler is inclined 1 ft. in 12 ft. from front to rear and stands with the base of the front water leg resting upon a cast iron fire front while the rear water leg, which is sup-



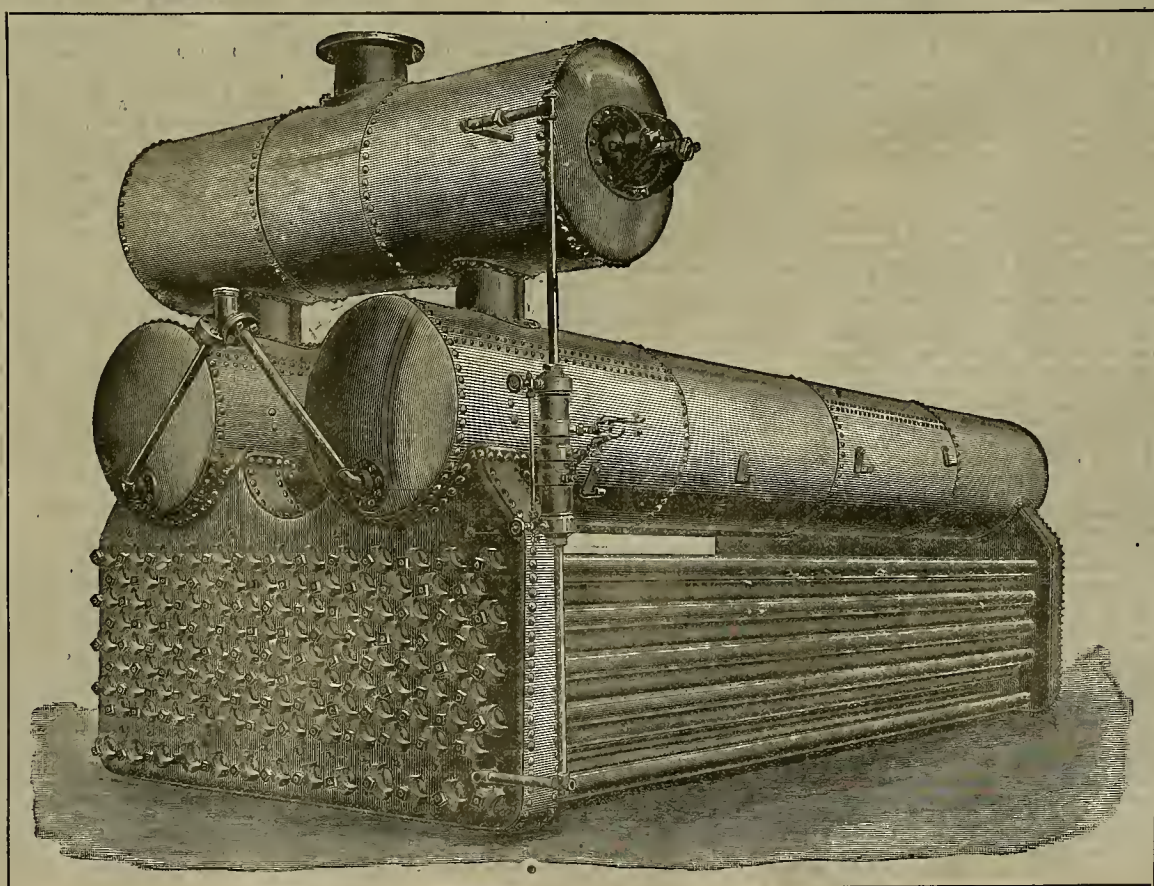
ELECTRIC GENERATOR FOR USE IN MINING OPERATIONS.—See page 201

ported by the roller, is free to expand or contract. The tubes thus rising from the rear to the front end give natural channels for the circulation of the water, which flows from the tubes into the enlarged area of the water leg permitting the ready and free separation of the steam bubbles. Both steam and water rising through the throat at top of front water leg are deflected by the deflection plate, the water flowing to the rear of the steam drum and dropping into the rear water leg to continue its circulation. The steam passing over the deflection plate to the perforated dry pipe or dry pan is dry and free from water spray.

The inclination from front to rear also gives a larger steam space in front and a larger water space in rear of drum (which is about one half full of water at middle gauge) thus giving very large steam liberating surface.

Every portion of the internal heating surface can be inspected from the outside and the tubes can be examined, cleaned and replaced easily. Among other advantages claimed are: No cold air currents; large steam space; ample steam liberating surface; hot furnaces and cold chimneys; no rivet seams in the fire; positive circulation; no cold feed on hot sheets; ample throat areas.

The Capitol Mill Co., of Los Angeles, have one of their boilers of large size under which they are using oil as fuel, and it gives great satisfaction. The fuel is severe on boilers, but in this case, only the tubes need replacing when burned out. The legs nor drums do not burn out, as the oil fuel does not affect them. The tubes are easily cleaned, as may be seen by the construction.



250-HORSE POWER HEINE BOILER READY FOR SHIPMENT.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Nevada County Mines.

NUMBER II.

North Bloomfield District.

[From Our Traveling Correspondent.]

The Derbec mine is situated on the Derbec or North Bloomfield channel and is operated at a point about one mile north of Bloomfield. The channel is opened by a shaft 466 feet to bedrock. The channel averages 300 feet in width. About ten feet of gravel, next to the bedrock, is extracted, though there is an average thickness of 370 feet of gravel that would pay immensely if the present injunctions on hydraulic mining could be removed. The ten feet worked gives an actual average of \$249 a ton. The channel has been drifted on for a distance of 7800 feet. At this time the superintendent is working back through the mine, removing pillars which will require several years to exhaust. The gravel is very loose and easily washed. The mine cars are hoisted to the surface, run out and dumped into a large dump-hox. Here the gravel is washed by a hydraulic giant which frees the greater part of the gold. The gravel passes down through a sluice-hox 600 feet long, the bottom of which is packed with car-wheels, laid on their sides, for riffles. The waste drops into an old gravel claim, where it is caught and held until the cement is all air-slacked, when the gravel is re-hydraulicized and run down the gulch 4000 feet where it is caught again, and in time hydraulicized and all the gold caught. From this point it flows into the old workings of the North Bloomfield mine, where it is all held. The Derbec is evidently in the North Bloomfield channel, but in a higher channel, which is far richer than the lower. There is a large extent of country adjoining the Derbec, on the same channel, that is idle and unproductive for want of capital to develop and equip. [Since our correspondent wrote the above, Mr. S. Galavotti, the superintendent of the Derbec, was murdered by highwaymen while taking bullion to town. An account of this outrage is published in another column.—Eds. PRESS.]

The North Bloomfield.

The North Bloomfield Co.'s mine is idle, awaiting the action of the Government, the owners firmly believing that once the rights of the hydraulic miners are properly understood and the immense territory and great wealth of the hydraulic mines made known, the Government cannot fail to provide a way by which these hoarded millions can be extracted and added to the world's wealth.

North Columbia.

Here, as at Bloomfield, the hydraulic mines are idle. The only properties in operation are the quartz mines, three miles north.

The Delhi.

The mine, C. H. Mallon, Supt., is on Grizzly ridge, on the west bank of the Middle Yuba and about 3½ miles from North Columbia. The mine is opened by a crescent tunnel, 1700 feet long, with drift run, from the end of the tunnel, 700 feet, on the vein. The end of the drift out the vein 1700 feet deep and shows a four-foot vein of \$4 ore, enclosed in slate walls. Mr. Mallon has recently driven a crescent of 10 feet, 350 feet from the end of the drift, and here struck the Delhi vein proper, which, at this point, is four feet in width, and very rich in free gold and high-grade sulphurets. The mill is of 18 stamps, and with the present high-grade ore must delight the owners with a large output of gold.

The St. Gothard.

Carl Davis is Supt. of this property, which adjoins and is situated immediately above and to the east of the Delhi. The mine is opened by shaft, which is now down 200 feet and will be continued to a depth of 600 feet. A drain tunnel 1000 feet long taps the vein 180 feet deep. In the tunnel the vein shows 2 to 5 feet in width. In the early workings of this mine the ore milled \$60 to the ton. The present owners expect to continue the development of the mine for another year, at least, before erecting a mill. The hoist on the property is calculated to go to 1000 feet. It was built by the Fulton Iron Works. The millwright is Mr. T. W. Jones, formerly with Conner & Grant, the well-known millwrights.

At Cherokee, North San Juan and Camp-tonville the only difference between them and North Bloomfield and North Columbia is in the degree of deadness. A few years ago there was no section of the State more prosperous. Stores, hotels, banks, etc., were all full of business, and no one looked aught of the future. To-day the towns wear a deserted, desolate air. In Cherokee the buildings are almost entirely deserted. The few people remaining are there simply because they cannot get away. While the miners and those engaged in business have been the principal sufferers, the farmers find themselves left without customers.

It does not seem possible that the billions of gold contained in the gravel deposits, that can only be worked by the hydraulic process, shall forever lie buried there, benefiting no one. Once the present work of the U. S. Geological Survey is completed and the extent of territory, value per yard and aggregate wealth is accurately determined and shown, the industry

will receive the recognition at the hands of the Government that this great and but little known wealth of the United States justly deserves.

Washington District.

The mines of this district are situated on the South Yuba river, 25 miles east of Nevada City and four to six miles on an air line due north of Emigrant Gap. The mountains here are almost bare of all kinds of vegetation and loom up grandly with their rugged and almost perpendicular walls—a prospector's paradise. The mineral bearing veins are all in the belt running between the slate and granite formation, which is here about three-quarters of a mile in width. It can hardly be called a contact as there is no direct or positive contact, but a gradual change of slate to granite for a width of three-fourths of a mile. In this belt the vein-walls run from slate to granite, being of a somewhat conglomerate character. Next to the granite is

The Eagle Bird Mine.

H. C. Callahan is superintendent of this mine. The company has recently purchased the stock of O. Newhouse—a one-third interest—and incorporated under the name of the Diamond Creek Con. G. M. Co., Mr. Newhouse, the former superintendent, giving way to Mr. Callahan, who had charge of the property previous to Mr. Newhouse. The mine is on the south bank of the South Yuba river, four miles due north of Emigrant Gap, with an altitude of 3400 feet. The vein runs from 6 to 20 feet in width, with an average value of \$8 a ton in free gold. The vein-matter carries a very small per cent of sulphurets that average \$120 a ton. The property is operated through tunnel and shaft. The surface tunnel is in 600 feet and onto the vein 360 feet deep. The two-compartment shaft is down 600 feet, with levels run 800 feet south and 300 feet north. The mine is equipped with a 30-stamp mill, 20 of the stamps being 850 pounds in weight and 10 an even 1000 pounds each, with six-inch drop. The superintendent prefers the 1000-pound stamps. The crushing capacity of the mill averages two tons to the stamp. The mine has its own water, which drives the mill under a 180-foot pressure and then drops 235 feet to the air compressors. Three Ingersoll drills are run on ore and two on development. At this time the mine has large reserves in sight. In addition to the mill the company owns and operate a sawmill that adjoins, or may be said to be a part of the mill. This, with the company's store, boarding houses, miners' residences and fine home of the superintendent, make the Eagle Bird a complete mining nest of its own, in this its craggy eyrie.

The Yuba Mina.

Geo. Hare is superintendent, and Haggin & Tevis are owners. The Yuba is situated about three-quarters of a mile below the Eagle Bird and on the same side of the river. The mine is developed by tunnel and shaft. The tunnel, which is 1100 feet long, cuts the vein 175 feet deep, while the shaft is down 800 feet, with drifts run 900 feet on the vein. The average width of the vein is five feet, with a milling value of \$6 to \$8 a ton. The mine is equipped with a 25-stamp mill crushing 60 tons a day. The Yuba has been in successful operation for 25 years and ranks among the oldest and most reliable mines of the country.

Champion.

J. S. Cook is superintendent. Campbell and Sanderson are owners of this claim. The Champion is high up on the side of Lindsey Hill, and about opposite to the Yuba. The vein is opened by two tunnels. The lower tunnel is 230 feet in length, and taps the four-foot vein 115 feet deep; the upper tunnel is in 100 feet, and taps the vein the same depth. At this point the vein is two feet in width. The superintendent places the average value of the ore at \$25 a ton. The higher grade ore is valued at \$500 a ton. In addition to the free gold the vein carries 10 per cent of galena sulphurets that assay \$4800 to the ton, as will be seen the ore now shown in the Champion is the richest in the camp. It seems to be Mr. Campbell's luck to "strike rich," as he has lately found it just as rich in his Washington mine in Calaveras county.

Ormonde.

The mining properties at this point, in the Washington district are under the charge of Mr. Alf. Tredidgo, the well-known and popular mining superintendent.

The Washington M. Co.

Property consists of five full locations—the Baroo, Becker, Don, Dee, and Dal, all on the same vein. The plant is erected on the Becker location, and consists of a complete 20-stamp mill, large boarding-house and offices. The Becker is developed by a tunnel 1320 feet on the vein, which out the vein 400 feet deep. The first shaft is sunk from the bottom of the tunnel and 125 feet from its mouth. The shaft is two-compartment, and is down 300 feet below the tunnel. This shaft is also extended up to the surface, where a steam-hoist is erected. When water is plenty the shaft is worked through the tunnel by water-power; but in times of scarcity of water, the steam-hoist on the surface is called upon. The first shoot of ore on the Becker has been driven on for a distance of 230 feet, and the end not reached. The ore in this shoot averages four feet in width of \$6 ore. The second shoot is 268 feet long, with an average width of six feet, and value of \$6 per ton. In the main tunnel south, 920 feet, a shoot of ore has been encountered which has not been driven through, as

yet, to determine its extent, the vein at this point is 16 feet in width.

Blue Ball.

Mr. Alf. Tredidgo is superintendent of this mine, which is on the north bank of the south fork of the Yuba, and is on the Eagle Bird vein, and adjoins the Eagle Bird property on the north. The mine is opened by shaft to a depth of 300 feet, with drift of 250 feet on the 100-foot level, and the same length of drift on the 200, with the vein averaging five feet in width of \$6 ore. The 300-foot level is now in good ore. The mine has a 10-stamp mill. The past record of the district is good and the future still more promising.

E. H. SCHAEFFLE.

Pacific Coast Marble.

EDITORS PRESS:—Having been a constant subscriber to your paper from its first establishment, I often notice articles in relation to marbles of various kinds being discovered in different parts of the country. It has often brought to my mind a deposit which I discovered on the Humboldt river when crossing the plains in 1850. I was on horseback riding along the road, when I discovered a singular-looking black rock rising up out of the level plain about 20 or 30 feet long, 10 or 12 feet high and the same in width. Back of it perhaps 100 feet, more or less, arose the hills or mountains skirting the valley, which I noticed to be of the same material and had that rough pitted appearance which all marbles have on exposure to the atmosphere for ages, and was hard and destitute of vegetation. It looked so black and firm that it attracted my attention, and I broke off a piece and put it in my traveling bag and brought it to California with me. It remained in my bag until 1861, when the Comstock mines were discovered, and, seeing some of the black ore from those mines, it reminded me of my specimen from the Humboldt, and I immediately hunted it up, but on comparing I found they differed very materially except in color. I then went to work and polished it, and found it to be a beautiful specimen of black marble with fine white and variegated streaks running through it, resembling what I have heard called Egyptian marble.

From the Central Pacific Railroad maps and my journal (which, by the way, I still keep), it must be very near Golconda Station, on the C. P. road, on the north side of the river, and cannot be over one mile from the railroad. If there are any of your embers living in that vicinity, I think it would be well for them to look it up. If I were in a condition to do so, I would go there myself and hunt it up, as the place is so vividly impressed on my mind I think I could go directly to the spot. There is also another deposit of very white marble at the junction of the Fort Hall road and Hedgepeth out-off road, near Raft river. It lies in an immense bed 20 to 40 feet thick, but I suppose that is out of reach of transportation. I also brought a piece of that with me to California the same year.

San Diego, Sept. 16, 1891.

W. A. BEGOLE.

The River Mining Dredge.

EDITORS PRESS:—The Carson River Placer Mining and Dredging Company are working in the tailings deposited in the river by several mills up along the river. The claim of this company is from 100 to 200 feet wide and several miles long, and contains quicksilver, sulphurets and gold. The deposit is from 15 to 25 feet deep, over virgin soil of 5 to 10 feet. The assay is all the way from \$2 to \$120, besides quicksilver from 1 ounce to 14 ounces.

Mr. Angel has the contract of replacing the scoop with a bucket dredger which will raise 600 to 700 tons per day. This passes through the belt amalgamator and separates anything free, and from the amalgamator over sluices to the concentrators.

The company has experienced some difficulty in getting the proper machinery for handling successfully this form of mineral deposit, but feels confident of success in their present effort, as this system of mining is better understood than formerly. The company estimate the cost of operation at 10 cents per ton, and if success crowns their present efforts, they have a life-work before them. Mr. Roe is the business manager and takes pleasure in panning out some of the river-bed gravel before your eyes.

Dayton, Nev.

GARD KENNEDY.

An Electrical Chlorination Process.

The first practical demonstration of the extraction of gold by means of chlorine is, it is believed, due to the late Prof. Plattner, upon whose discovery all subsequent improvements are based. The most noteworthy modifications and improvements are those of Calvert, Jackson, Ott, Meares, Daeken, Patra, Rosner, Hanok, Newbery and others of less note. The introduction of electricity in the extraction of gold is of more recent date, and the leading names of those who first adopted this method are Ploehner, Ansel and Marie and Cassel.

Mr. Th. Ranft, M. E., of Sydney, has just introduced an electric chlorination process, says the *Australian Mining Standard*, in which he claims to have overcome the vital defects before experienced in electrical chlorination, viz., the getting rid of the sequent hydrogen and sodium as they are formed by the electric current when passing through the electrolyte. In

all processes where the hydrogen cannot be kept separate from the chlorine gas, the two will combine and form hydrochloric acid, which combination does not solve gold and is in every way most injurious to the process. The inventor does not claim or patent any new law, but an apparatus by means of which the laws observed are complied with. The apparatus consists of two cylinders, one within the other. The inner cylinder, made of a porous material, serves four functions, viz.: First as a filter; 2d as the negative pole or cathode; 3d, it acts as a burrette to allow the precipitated gold to escape along with the caustic soda, and lastly it allows the former hydrogen gas to escape at the top. The outer cylinder, which is air-tight (except at the places where it is required periodically to discharge), serves three purposes: Firstly, it forms the positive pole or anode of the battery, next it acts as a chlorine-gas generator and store, and lastly as the chlorinating vessel.

The process performed in the apparatus is described by our contemporary as follows: The ore to be treated (free of sulphur, arsenic, lead, zinc or bismuth) is mixed in certain proportions with common salt. It is then fed into the outer chamber, where the anode is, and the electric currents enter. Water is then added, which dissolves the salt in the ore, and this, combined with the saline liquor, forms the electrolyte. An electric current from a dynamo is then led into it by the anode, and passing through the solution into the inner chamber or cathode, is discharged back to the dynamo. The chemical actions produced by the passage of the electricity is to decompose the electrolyte into its elements. Hydrogen and oxygen are the products of water, chlorine and sodium those of the salt. Hydrogen being a positive substance, deposits on the negative pole; oxygen, on the other hand, being negative, deposits on the positive pole. Chlorine and sodium deposit respectively on the positive and negative poles. In order to prevent the accumulation of oxygen and hydrogen, contrivances are provided which continually wash the surfaces of the anodes to prevent polarisation, which would stop the whole process. With regard to chlorine, it has been established by Bisguet that chlorine in its nascent state is more active than afterward, so that if in the ore under treatment any gold is present, it would not be most readily attacked by the chlorine and form itself into chloride of gold (salt of gold), which again is soluble in water.

The gold now being in solution is readily acted upon by the electric current. The molecules, as established by Grothius, 1805, are under the same condition as any other molecules, which in their transit to the negative zone become split up into their elements, the chlorine parting and returning to the positive zone, whilst the gold is deposited on the negative pole in a fine metallic condition in the inner chamber. From this it is washed and drawn off in the contracted part of the inner chamber in conjunction with the caustic soda and passed through a filter. The powder is then calcined and the gold remains.

The gold having been extracted from the ore, the latter is drawn off at the bottom of the outer cell and an equal amount entering simultaneously at the top from a hopper, in which it has been mixed with the salt, makes the action continuous. In a working plant every ton of ore will be virtually from 20 to 24 hours under the chlorinating and electrical influence, and travel about 20 feet, which will give sufficient time for effective treatment.

As to the cost, adds the *Mining Standard*, it is estimated to be about one-ninth of the present cost of chlorination, or that 3.5d. per ton should cover the cost, supervision and sinking fund for capital. The inventor estimates the outlay for a complete plant to be £250, exclusive of an engine to drive the dynamo.

The Gravel Mining Industry.

A correspondent at Gold Run writes as follows to the *Colfax Sentinel*: "I was much pleased in reading your Dutch Flat correspondent's letter, and particularly that part which alludes to mining. Every newspaper correspondent should agitate the subject until the mining industry, that has been so long and so unjustly oppressed, be protected and again recognized, as it should be the foundation of every industry of the State. One year prior to the downfall of mining, the deep channel passing through Gold Run was opened by an expensive tunnel from Canyon Creek, powder alone costing over \$84,000. The claim was one among the first to be enjoined. The last run it made of 130 days it cleaned upward of \$100,000. From this point north three miles it is estimated it would take 40 years to work it. It would give employment to 300 men and give a net profit to its owners of \$300,000 a year. At Dutch Flat the channel is more developed, having been opened in several places, and is richer in character and all in readiness for working, with the best hydraulic machinery in the world. Crossing Bear river at Dutch Flat, we soon enter Little York and You Bet, which mines were unsurpassed in richness only by North Bloomfield and Cherokee Flat. These four mining camps would give employment to 1000 men and a profit to their owners of at least \$1,000,000 a year. North and south across the State we find the mines on this channel in a crippled condition and every industry suffering thereby. Should not something be immediately done? Take the taxable property of Yuba and Sutter counties to-day and com-

pare it with that of 15 years ago. Marysville, once the most prosperous business city of the State, surrounded with fertile soil, behind her inexhaustible mines, is a Chinese trading-post compared with what she was. What has done this? The question can be easily answered. Where is that great mining trade that once gave life and bustle to all around? Gone to Sacramento county, whose wisdom was proof against any affliction with the Anti-debris Association that has pauperized their county and done so much injury to the State. They say: "We admit the elephant cost too much, but the hay and harbor of San Francisco is worth more to the commerce of the world than all the mines of the State." The hay and harbor of San Francisco is as safe from injury by mining as the gulf stream.

"When the waters of the inland seas of the State were emptied into the great Pacific, it created a channel for everything to pass that must necessarily follow, but the Sacramento river navigation was destroyed before any mining had been done. How many a man of the days of '49 was derailed on the Hogsback; and now steamers of any size pass to and fro without difficulty. Can this fact be denied? We must admit that mining has ruined some valuable land and beautiful homes, but where one acre of good land has been ruined, fifty have been made productive that were worthless. Where one individual lost all, fifty have been made wealthy. This needs no argument. Every one who has seen the land subject to overflow by mud, will see the benefit of min-

Placer Mines

Being Run without Violating the Law.

The closing of the extensive and rich placer gold mines throughout California was a great calamity to the miners, says the Sacramento News. That it was necessary is generally admitted; but since the day the mines closed the question of how such mines could be worked without detriment to the navigable and unnavigable rivers of the State has been a matter of much speculation. Every one has confidently believed that the time would come, and at no distant date, when the interests of the miner and farmer would be harmonized. For a time the miners hung their hope and faith in the Legislature, but the problem proved too much for them.

Geology, enterprise and the development of the fruit industry of the State, it appears, are about to open the throats of the rusty monitors.

Without assuming to be prophetic, it is not too much to say that at the very least the question has commenced to ravel, and the solution is not far distant.

Among those who are taking practical steps to reopen the placer mines may be mentioned the Hill Top Company of Sacramento county, operated by Ballard & Byam, and the Forest Home mines, Amador county.

The Hill Top Company has been operating for the past three years from four to six monitors, being run continuously night and day.

The modus operandi was explained by Mr

The Migration of the California Sequoias.

[Graduating essay of Mr. CHARLES PALACHE of the class of 1891 of the University of California.]

Ask an Arctic explorer to tell you of the forests that clothe the regions of the far north, and he will describe the shrubs and tiny flowers which alone represent the floral kingdom in those desolate regions.

Yet by proof that is incontestable, we know that, at a period geologically recent, the polar zone was the seat of the grandest and most varied forest growth that has ever existed on the face of the earth.

There, circling the pole, in a climate differing not much from that of California, flourished the ancestors of the trees that now, widely scattered, find their homes in Asia and on the slopes of the Pacific ranges; trees that skirt the western shores of the Atlantic, and border the seas of Southern Europe.

A polar forest! where, wandering in imagination, we may see tree upon tree so like to its congener of the present day that the botanist alone may discern a difference; where, lord of the forest, the giant Sequoia overshadows with its mighty dome the noblest of its rivals.

The genus *Sequoia* consists of but two species, the Redwood of the coast and the Big Tree of the Sierra, both found in California alone, and there in localities most remarkably isolated. These two trees lack all connecting link

But how with plant life? Must not these vast forests of sub-tropical trees perish in the van of the glacier? Surely they cannot fly the advancing ice flood! No! as individuals they must die; but so slowly comes the change that many are enabled to modify their functions for existence under new environments, and the new generations move with a common instinct ever southward. The most conservative estimate makes the Sequoias of our day as old as the Christian era, and a thousand years is, therefore, a moderate allowance for a generation. Judge, therefore of the lapse of time needful for the passage of this majestic procession, where every step consumes ten centuries.

Types not readily yielding to the modifying influences perish. In the tramping, pushing throng of refugees, many are trampled under foot. Many, as invaders, struggling for possession, fall before the inhabitants of a new land. What wonder, then, that species are lost. Surely here must be the "survival of the fittest."

We have seen that in the circum-polar forests the species were somewhat uniformly distributed. The disturbing cause was at or near the center of the zone. Hence, as each species would seek the shortest route to safety, we should expect great similarity in the forests of all the northern continents.

But on the contrary, we find the greatest diversity, and the explanation of this apparent anomaly is found in the diverse conditions which were met along different lines. In one direction a species might find all things favorable to its continuance; in all others the obstacles were insurmountable, and it perished. Or the species might perpetuate itself on two widely divergent lines. And accordingly we find many American species duplicated or paralleled in Asia, while as a whole the floras are so different.

In the light of this history, revealed by geology and interpreted by evolution, we can read plainly the story of the California Sequoias. Twenty species at least started on the long journey toward the equator. In the struggles that ensued all save two perished, leaving in the rocks of Europe, Asia and America memorials which might testify to the former greatness of the race.

It is a law of evolution that species reach their highest development in size and function shortly before their extinction. Since we can not believe that Sequoia can surpass its present self in bulk, grandeur or beauty, we should be forced to the conclusion that it is the last of a long race, whose end can not be distant were it not that a new and most important factor has appeared to modify the law. Man, so potent an agent in the destruction of many types, will here become the savior of a race, for through him the countries that knew Sequoia centuries ago only to lose it, will again be stocked, and the tree will begin a new era of its long life history.

In California's fairest Sequoia grove there stands a noble tree, bearing the name of one who has lately gone from our midst, revered, beloved and lamented.

The tree is the embodiment of all that is noble, beautiful and perfect in the floral kingdom—a summation of types, a monument of ages.

The man was the embodiment of truth, beauty and nobility—the undying characters of manhood.

What more fitting memorial could mind devise or nature evolve to perpetuate the name of one whom we remember but to admire and emulate?

[The touching allusion with which the essayist closes is to the late Prof. John Le Conte, who died but a short time before commencement.—EDS. PRESS.]

The Real Rain Maker.

WASHINGTON, September 14.—The real inventor of the rain-producing process has been discovered in the person of General Daniel Rogers of Fredericksburg, Va., to whom a patent was issued ten years ago. He served in the Mexican war, and at the breaking out of the civil war cast his fortunes with the South, the result being that he came out of the army impoverished and broken in health. He is now over 80 years old, and for a number of winters he has been endeavoring to enlist aid from Congress to make the very experiments that have been made and are to be continued under the supervision of General Dyerforth. He finally secured the assistance of Senator Farwell, who offered an amendment to the general Appropriation bill whereby \$10,000 was set apart for the proposed experiments. It was stipulated in the amendment, however, that the experiments should be conducted under the auspices of the Department of Agriculture. It is understood that a syndicate of Washington capitalists, satisfied that the invention has proved a success, have offered General Rogers \$75,000 for his patent, their idea being to sell it either to the general Government or to the several States.

A SUN-BURST.—A luminous outburst on the sun was observed by French astronomers on the 17th of June. First appeared a luminous spot of a yellow golden tinge, soon followed by another just above it. The spectroscopic showed the first spot to consist of a central eruption, from which volcanic bombs were thrown to heights above the chromosphere, where they seemed to rest as dazzling halls. A few minutes later these were replaced by brilliant jets or filaments.



ON THE SUMMIT OF MT. TAMALPAIS.

ing to worthless land. One instance to prove this: The Cherokee Flat mines destroyed their outlet, Dry creek, embracing 300 acres of fine land and eight or ten beautiful homes, which they paid dearly for. Their tailings spread far and wide over the plains that were worthless for even sheep-grazing, and now they have more than 7000 acres of as good wheat land as there is in Butte county.

"Is it not time the mining interest was protected? Every industry of the nation and State demand it. Should it not at least enlist the sympathy of that government that has so long raveled in its spoils? Hundreds of millions invested in it are idle and perishing, where millions were produced and put in circulation to the growth and prosperity of our loyal State."

The Summit of Tamalpais.

Many who gaze upon Mt. Tamalpais from the great region of sea and bay, hill and valley, plain and populous town which lies spread beneath it, will be interested in a view of the actual crest of the mountain as shown in the engraving on this page which is made from a recent photograph.

Mt. Tamalpais is the greatest elevation which can be seen to good advantage from San Francisco and the region of the bay north of San Francisco and Oakland. It is true that we can look from the metropolis across the hills back of Oakland, and see the broad back of Monte Diablo and sometimes from our hilltops we can catch a glimpse of Mt. Hamilton east of San Jose, but Tamalpais is the only height of which we have a close view. Its shapely proportions and the colors which play upon its sides at sunrise and sunset make it a subject of constant adoration from city and suburban gazers.

Tamalpais is reported as 10 to 15 miles distant from San Francisco according to different estimates or measurements. It is located in Marin county and is consequently northward from the city, and on the northern side of the narrow channel by which ships pass back and forth from the Pacific through the Golden Gate.

Ballard, the superintendent, to a representative of the News.

"Certainly," said Mr. Ballard, to the reporter, "I will explain our method of operating. It is most simple, and is one which I believe will be generally adopted.

"Our company owns a valuable water-right, and was operating extensively at the time the mines throughout the State were enjoined. The question with us, as with all the other mines, was what to do with our debris.

"The company finally purchased large tracts of valley and foothill lands located some 15 miles below the mine, and at great expense an irrigating ditch was constructed to the tract.

"We now had a means of disposing of the water, which, after being used in hydraulic mining, was so objectionable to the Anti-debris Association.

"We had yet to dispose of the gravel and heavy sediment, and we resolved to try an experiment. We applied and secured permission of a farmer owning a large tract of dry foothill land adjoining us, to run our debris and water upon his property, explaining, of course, our purpose. Dams were constructed of earth across dry and rocky ravines, and from time to time as they filled up, we raised them. We settled all the heavier particles of debris carried by the water on this farm, and took the water up below in our ditch, which we conveyed to the company's tract for irrigating purpose."

"We managed to fill place after place with coarse gravel and as it leveled up, the current was checked, naturally finer particles settled and formed a fine soil.

"The result is, that now, after three years' run, we have made the farm one of the most valuable in the county. Where, when we commenced work, the land produced only a small crop of short annual grass of no value worth mentioning, now it produces a heavy crop of green feed the year round. The owner has become one of the most prosperous cattle men in that county, and the value of his land doubled.

"This same system is being put in operation at Forest Home, some miles above us. It appears to me to be the only practical one."

with the other members of the Cypress family, to which they belong.

Along systematically and geographically; hoary with age; wonderful in bulk and stature, and seemingly immovable as the hills—they stand. Imperatively the question arises, Whence come they? Did they spring where now we find them, full nurtured from the hand of the Creator? Are they the forerunners of a new race just entering upon its course? Or are they the last scanty remnant of an exhausted stock, now tottering to its fall?

Let us see if geology will not, as a master-key, unlock for us the dark volumes wherein, with fossils for her symbols, nature has written the answers to these riddles.

The book of Time has told us that of the Tertiary circum-polar forest, Sequoia was an integral part, exhibiting many species and connected by existing forms with its ancestors.

Evidently our tree is not a new one! Yet how came it here? By what magic were our groves transplanted from the pole, and why are we alone the fortunate inheritors of this great legacy of the ages?

We read the answer in a new chapter of the earth's history—the Glacial Epoch, or great Age of Ice.

The canons leading to the accumulation of the vast ice mantle, which, with steady advance, spread chill and desolation over most of the Northern Hemisphere, are yet but vaguely understood by geologists. Certain it is, however, that, beginning at the end of the Tertiary Period, there was, throughout the polar regions, a slow and constant fall of temperature, which in the course of centuries produced an entire change in the climate of that zone.

And as the correlative of this change began a migration, the most remarkable that the world has seen, a flight for existence of a whole life system. For slow as was the advance of the ice wave, immediate and sensitive was the response of fauna and flora, and hence their retreat.

For the animal kingdom it was an easy matter to yield to the pressure of an uncongenial climate, and southward wandering, seek new homes.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

SALT-MAKING.—Haywards *Journal*, Sept. 19: Your reporter this week paid a visit to one of the chief industries of Mt. Eden—salt-making—this week, and buckling on our "salt shoes," spent a pleasant and instructive visit along the salt marsh. The largest manufacturers, of course, are the U. P. works. We find that the local output this year by them will reach 10,000 tons. Next comes P. Maricano with 3000 tons from five ponds. Then comes D. Pestdorf with 1500 tons in sight and clear weather will add another 1000 tons. Mary Mickelson will have 1000 tons and the Oliver Bros. the same amount, and L. Whisby a like amount. C. Madsen has 300 tons in sight and with any kind of good weather will secure 700 tons, H. P. Jessen will have 400 tons, Claus Pestdorf, 300 tons, Janies Tucksen, 300 tons, besides shipping 300 tons, Chris Green, 250 tons, Mathiesen Bros., 200 tons. In regard to the effect the rain will have on the salt, the most extensive damage will result to the salt in the ponds.

Amador.

FREE OF LITIGATION.—Amador *Ledger*, Sept. 19: The attachment suit of George Newman against the Clinton Con. M. Co. was settled last week, the defendant paying the amount claimed and the costs being divided among the parties. The suit against the Macato mine has also been dismissed, so that the Clinton Con. is now free from all legal entanglements. The Plymouth Con. will start 20 stamps in a few days. The Bunker Hill paid one-half of last month's wages of the employees and promises to pay the balance the end of this week. Lumber is being hauled from Whitmore's mill to the New York mine in John Bull's gulch, to be used in the construction of a mill building there. The machinery for the large Huntington mill will be shipped just as soon as they are ready for it. The Clinton Con. paid off its employees in cash at the mine on the 16th. Heretofore the men have been paid by checks cashed by business houses in Jackson. This involves a trip to town to get the money on the checks and consequent loss of time. Payment in coin is much preferred by the workmen.

FROM SUTTER CREEK.—Cor. Amador *Ledger*, Sept. 19: The work of drifting on the North Star is being pushed with all possible speed. Although over the boundary line, the lease they have secured will enable them to continue exploration indefinitely, or until they are satisfied. Sinking at the South Eureka is progressing in a satisfactory manner. They are already down 150 feet. The ground is quite soft, which enables them to make rapid headway. Buildings are being erected for protection against winter storms. Some changes are being made at the Lincoln mill. As the north portion of the mill about the mortar docks, guides, etc., is giving way, they are moving the stamps to the south end, where the mortars and framework are good. This will enable them to run 15 or 20 stamps for years to come, that is, as far as the stability of the mill is concerned. The ore now being crushed is of fair quality, and Chas. Smith, the millman, is apt to work it for all it is worth.

THE SILVER STAR MINE.—*Dispatch*, Sept. 19: This mine, located near the Gate, and which is just being developed by Messrs. Mello & Co., is turning out to be a first-class mine. We were shown some extraordinarily rich rock taken out of the mine a few days ago, which was literally filled with free gold all through. Their little mill was doing good work, and a "clean up" last week showed that the ledge was yielding fully as well as the owners had any reason to anticipate. We understand the mine has been bonded to capitalists below for \$20,000, and that they will soon commence working it on an extensive scale.

ANOTHER QUARTZ MILL.—The grading for the site of a 20-stamp mill at the New York mine, about three miles below town, is nearly completed, and the work of erecting the mill will be commenced next Monday. A portion of the machinery for the mill has already arrived at Ione and will be hauled up as soon as needed. The mine has been pretty thoroughly prospected under the able management of the superintendent, Mr. W. G. Anderson, and the owners were fully convinced of its value and permanency before they would go to the expense of putting up a mill.

Butte.

GOLD POOR.—Oroville *Mercury*, Sept. 18: Much has been said and written about the undeveloped mining sections of this and adjoining counties, but it is seldom we hear the expression that any community of people is "gold poor"—that is, gold poor in the same sense that men are land poor. A *Mercury* reporter this morning, in conversation with A. Ekman, the well-known assayer, who has recently been on a trip through the Sierras, heard that expression. "The people of the mining regions adjacent to Oroville and extending into Plumas county don't know their wealth," said Mr. Ekman. "They are actually gold poor; that country is covered with ledges teeming with gold, and comparatively little of it is extracted. What that section needs is more capitalists and more scientific miners." Two new mills are being built in the Spanish Ranch region—one of 10 stamps and the other of 20.

Calaveras.

THE OLD UNION MINE.—*Prospect*, Sept. 19: Workmen have been engaged during the week in hauling timbers from Mr. Ratgeb's mine, near the Boston, to the Union mine, which also belongs to that gentleman. We learn that Mr. Ratgeb is about to retimber the old shaft on the Union, and will then proceed to work it on an extensive scale.

GRAVEL MINING.—Hugh McCosley of Mokelumne Hill was in town Saturday last in company with C. E. Prindle of the Mokelumne Hill & Campo Seco Water Co., to make arrangements for the extensive working of his gravel mine near that place. The gravel deposits near the Hill have heretofore proved very rich and it is hoped that his mine will prove no exception to the rule.

ANOTHER STRIKE.—Last Thursday the men at work on the Venus quartz mine at Campo Seco to the number of 16 went on a strike, not for higher wages, but for what was their due. Several months pay is due to the men, and they came to town

Thursday night and filed liens on the property. The men say that the mine looks well with a good vein seven feet in width, and that at a recent cleanup over a thousand dollars was taken from the mill.

El Dorado.

PYRAMID.—Mt. Democrat, Sept. 19: The Pyramid mine, 12 miles west of this city, is being opened in good shape and a large mill will be erected on the ground. This promises to be one of the most extensive mining plants in this county. The ledge is large and crops out several feet above the top of the ground and is prospecting well in free gold. The Sailor Jack mine in Green Valley district is showing very rich ore. A tunnel has been run to tap the vein over 100 feet from the surface, where it is found to be two feet wide, of ore in which free gold is plainly to be seen through its entire width. A fair percentage of sulphurets is contained in the ore.

GREENWOOD.—Some very fine looking ore has been shown us from the vicinity of Greenwood, which has been attracting some attention. This ore seems to contain a large amount of lead and is said to carry \$2 to the ton in silver. It appears to be of a nature that can be worked by smelting. The Taylor mine is reported to be turning out some very rich ore. The Los Padre mine near Nashville seems to increase in width and richness as depth is attained. Some little water is encountered but not enough to materially retard work. The Church mine at the 600-foot level is sending up better ore than they have ever had above that level. At the Harmon mine an upraise is being made from the tunnel to meet a shaft which is being sunk from the surface. In both of these places the ledge is about six feet wide, of rich ore. The Gentle Annie is running regularly and making her usual output. The tunnel at the Blair mine is now in 1400 feet. It is the intention of the company to make an upraise into the gravel channel as soon as they have reached 1500 feet with the tunnel. Much interest is felt in this work as it opens a large extent of what is believed to be a rich gravel bed. Some encouraging new developments are being made in the Baltic district. It is reported that 10 stamps were started up at the Plymouth Con. mine on the 15th inst. The output at the Canada mine for the month of August was a little over \$40,000.

THE VAN.—Georgetown *Gazette*, Sept. 17: Present indications point to an early settlement of the Van mine difficulties. Connant stepping out and Baldwin & English assuming full control. If this be true, it will not be long before the Van will be equipped with a large mill and producing golden bars.

Fresno.

WEST SIDE OIL.—Fresno *Republican*, Sept. 18: Continued favorable reports come in from the Coalinga country regarding the oil finds in that region, and the work of developing is going on as fast as possible, the money being sufficient and the energy and experience not wanting. The oil fields of which there is the most talk, and in fact the only portion that is being talked about at all, is located on sections 17, 18 and 20 of township 19, south and range 15 east, or about eight miles a little east of north from Coalinga. The company which owns the claims on these sections is a Los Angeles corporation, and has hitherto done but little in the way of development. On August 4th the corporation, through its representatives, leased to W. R. Rowland and William Lacy the south half of all three sections, the consideration being that the development work should be pushed forward. According to the terms of the lease, Messrs. Rowland and Lacy must, within 60 days (before October 4th next), furnish the necessary derricks and drills for oil. The work must be prosecuted reasonably until oil is developed or until there is sufficient proof that oil cannot be developed. Messrs. Rowland & Lacy have been pushing matters since they secured the lease, and though the 60 days have not passed, they have the derricks and drills in position and had begun work. They have one well down a considerable distance and can take from it at least ten barrels a day now, and if it is agitated it will flow much stronger. They have pushed the work far enough to know that there is oil in paying quantities, and are now holding off a little until they can get everything prepared for handling the oil when they succeed in getting a heavier flow.

Nevada.

COTTON TAIL MINE.—Grass Valley *Telegraph*, Sept. 16: The Cotton Tail mine is located in Rough and Ready, on Torpie's farm. It is bonded for two years and is being worked by James Stead, Josiah Andrews, Oscar Patterson, Wm. Torpie and John Williams. The parties named have been working the mine, now at a depth of 25 feet, for three weeks and Friday night they brought to this office sample ore from the claim. It showed gold freely and the rock is of high-milling grade. The bonder, it seems, have a good prospect in sight. The hanging wall is slate and the footwall of porphyry formation.

ANOTHER DIVIDEND.—With most gratifying regularity for the past few months the Morning Star gravel mine of Iowa Hill has been declaring dividends. To-day No. 6 of \$1 per share was levied and payable at once. The Morning Star is destined to pay many more in the future with its capable management.

TO ERECT MACHINERY.—Grass Valley *Telegraph*, Sept. 18: The Jack Rabbit M. Co., encouraged by the result of their recent crushing at the Crown Point mill, and also by the present appearance of the mine, have purchased the hoisting and pumping works now on the Alaska and Ben Franklin mines. The machinery will be immediately moved to the Jack Rabbit and put in place for further developing the property.

CALIFORNIA MINE.—Wm. May has about completed his work in erecting the hoisting and pumping machinery at the California mine. To-morrow steam will be started and on Monday next it is expected that the work of sinking the shaft deeper will be begun. A battery will be immediately built and soon the company will have its own mill complete.

W. Y. O. D. MINING CO.—Grass Valley *Union*, Sept. 18: The annual meeting of the W. Y. O. D. Mining Co. was held on Tuesday, at which J. R. K. Nuttal of San Francisco, Joseph and Jacob Weissbein, C. A. Brockington and W. J. Connors of Grass Valley were elected directors for the ensuing year. The Board organized by electing Mr. Nuttal as President, Mr. Connors Vice Pres., Jos. Weissbein Sec'y, and Weissbein Bros. & Co. Treas. C. A. Brockington was reappointed Supt.

Placer.

HOMESTAKE.—Placer *Herald*, Sept. 19: The Homestake quartz mine, near Forest Hill, owned by Remler, Russell, Bilkey and Neal, is said to be looking fine. At present the mill is closed down to allow them to put in a 30-foot overshot wheel in place of the Hurdy, as they have hardly water enough to run the latter.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, Sept. 20: G. P. Cornell, owner and superintendent of the Green Mountain mine, went to Oakland, last Sunday, taking his family with him. Mr. Cornell will return in about ten days. The work at the mine is in charge of Foreman Ghidottie, who informs us that work is progressing very rapidly. In the work of opening up the tunnel he expects that in two or three weeks, the back chute will be reached.

San Bernardino.

TEMESCAL TIN.—The following communication, signed by S. Harris, mining manager of the Temescal tin mines, appears in the South Riverside *Bee*, Sept. 16: So many damaging reports being in circulation the past week or two respecting the change of management and the mode of working at these mines, which is quite misleading to the public, and in duty to myself wish the facts to be known. I observe in the *Perris News Era* a paragraph headed "Cajalco Cornishmen," that Americans are being discharged at Temescal tin mines to make room for aliens. This I totally deny. I have been here in charge of all mining work three months; during that time not a man of any class has been discharged, in fact we have been constantly increasing. We have now employed here close on 100 men, all on practical mining work, and I can fearlessly say, out of that number we have only five Cornishmen on the works that have come to this country within the past five years. We have about 15 here that claim to be Cornishmen, but have been in this country varying from 15 to 30 years, and never intend returning to the old country again. I also observe in the same paper another paragraph headed "Temescal Tin—Is the Output to be Restricted for England's Gain?" What sane man could imagine, after a company spending three-quarters of a million dollars, as this anonymous correspondent puts it, would in any way try to restrict the production in favor of or to benefit the Cornish producer. I can assure him it is not so, but they wish us to raise and to bring to market every pound that can be judiciously done. The present management don't believe in leaps and bounds, but go steadily and cautiously on. In this way we hope and expect to lay open a permanent and profitable mine, pay the company back their money with good interest, and prove a blessing to this neighborhood.

San Diego.

RICH STRIKES.—Julian *Sentinel*, Sept. 17: The rich strikes that have of late been made at the Stonewall, Helvetia, Gold King, Cincinnati Belle and Warlock mines have sent the camp merry on its way toward a prosperous winter. There are projects now on foot and others contemplated that, if consummated, will make Julian and vicinity, before December 1st, one of the liveliest camps in Southern California.

AT THE HELVETIA.—The rich find at the Helvetia continues to be the all-absorbing topic of the time. As to whether or not the rich lead now being worked is the Old Helvetia ledge, there is a diversity of opinions among miners. If it should prove to be the original Helvetia, the rock now coming out affirms the popular belief that when the Helvetia stopped work years ago there was still rich ore in sight. If the rich strike is not on the Helvetia ledge, then Mr. Havermale is to be congratulated indeed in the certainty that exists of still another rich strike when he encounters the Helvetia ledge proper. One strong circumstance that tends to prove that the recent find is a new and distinct ledge, is the fact that no water has been met with in the drifts, while the Old Helvetia was continuously troubled in this respect. Be it one or the other ledge, the truth stands forth clear and bold that the rock now being taken out of the lower levels of this mine has never been surpassed by any mines in this camp, even in the palmy days when the Banner mines were turning out fabulous wealth. It is no word-painting or stretch of the truth to say that some of this quartz is literally stuck together and binged with gold, and this not in mere isolated pieces or specimen rock, but great chunks of ore coming up with each bucket are scored and seamed, flaked and spotted with the precious metal. It is open to any one to verify these statements by a personal inspection at the shaft-house of the mine, where the buckets rise every few moments and dump their contents. Here there is no attempt made to conceal, diminish or exaggerate the truth. Particular significance is attached to this strike as going to show that the Julian mines are not all on top the soil; that there is gold beneath the grass roots and that too in magnificent quantities. All that is needed in Julian as in any other gold camp is for individuals or companies to apply capital and industry with a proper amount of skill and patience. At the time of our going to press the men at the Helvetia have proceeded along the vein 30 feet from the point where the strike was first made, and there is as yet no abating of the rich rock. An encouraging feature is that the vein is wider on the bottom of the level than at the top, which goes to show that the biggest end of the strike is still farther down. George Plant and C. E. Smith have been busily at work on the ledge near the old Washington. They worked like beavers and have driven a 35-foot cut and a 40-foot tunnel toward the main ledge within the past ten days. They expect to strike good rock within a few days. The Warlock mine is continuing to yield the boys rich returns. Another crushing will soon be made.

San Luis Obispo.

OUR ASPHALTUM INTERESTS.—Attoyo Grande *Herald*, Sept. 19: One of the interests of this part of the county is now attracting some attention. On many occasions we have, through the columns of this journal tried to interest some of our local capitalists in the vast beds of almost pure asphaltum that lie within a stone's throw of our depot. Up to the present time, however, our advice and suggestions have been unheeded. Now, glad to notice, a couple of enterprising gentlemen from Los Angeles, Mr. Hutton & Co., have leased the asphaltum deposit of Mr. Sanford, which is known as the Tar Springs. They are now putting up works for the purpose of eradicating all the refuse material so as

to enable them to transport nothing but the pure article to market. Our asphalt beds extend from within a few hundred yards of our railroad depot to the Tar Springs, a distance of ten miles, with here and there a spring where the pure stuff is oozing out at the top of the ground. There is one of these springs on Mr. Sims' ranch near the mouth of Tar Spring canyon, another on Madam Tapia's ranch, one mile above. Mr. Sims has run a 40-foot pole down his asphalt spring without finding bottom, which proves that the supply is inexhaustible while the quality is equal to that of Mr. Sanford's tar spring. We understand that parties are negotiating for this property with a view of opening a mine and preparing the asphaltum for work. Mr. Hutton informs us that the material is making quite a reputation in Los Angeles. Asphaltum is being used there from all over the county, and they find from experience that the asphaltum shipped from this locality is much superior to that from any other. He is now at the ranch preparing to mine it more extensively than ever. In the light of this information it is probable that the shipment of asphaltum from this locality will be greatly increased and the deposits become more valuable.

Shasta.

SHUT DOWN.—Redding *Free Press*, Sept. 12: The shutting down of the Walker Bros.' (of Salt Lake) mine in the Old Diggings mining district has been a surprise and somewhat of a mystery to many, as it was well known that the ore taken therefrom was rich. But a visit to Mr. Rippetto, Supt., explained the reason. The rock is of high grade, but from some unexplained cause no process now in use will save the gold.

CALUMET.—Ore from the mines of the Calumet Company, on Flat creek, is being hauled to the new mill of the Shasta Gold Extraction Company, and will be worked by the MacArthur-Forrest process. The Calumet Company owns five mines on Flat Creek.

A PROMISING MINE.—Cor. Shasta *Democrat*, Sept. 16: Being called upon to visit a mine belonging to David Pesenti, situated between Spring and Flat creeks, about 1½ miles west of the Sacramento river, I found that he had a good-looking vein. I made several tests of the ore and it runs high in gold, to make it a good investment for capital that is seeking mines. The strike of this vein is nearly east and west, with a dip of 82½ degrees to the north, easy of access, and as far as development work has been done, proves the continuity of pay rock. He has run a crosscut 32 feet to strike the vein and 34 feet on vein west, which gives 35 feet vertical depth in the drift and on surface has uncovered the ledge for about 75 feet, with cuts and shafts here and there, and from floor of tunnel to surface the assays will average over \$60 per ton. As Mr. Pesenti worked 1½ tons in an arrastra, the returns I saw from Selby's—\$58.40—go to prove that this mine can make a good showing, as this was only the free gold that was saved, for sulphurets cannot be saved with the arrastra. This county has undoubtedly many more such propositions if they were only uncovered, and, using the prospectors' own phraseology, "strike it rich." Her gulches were rich with gold that came from the veins that course along her mountain sides, and all it lacks is energy to bring Shasta county to the front as one of the great bullion producers of the State.

SOME OF THE MINES.—Redding *Free Press*, Sept. 19: The following is a list of some of the mines of Shasta county, ores from which were exhibited at the late Shasta County Fair. The mines are all good and the ore averages well. First is the Summit mine, located at Sunny Hill, which is owned by the Bell Bros., and has been operated for over one year, the ore being shipped and getting large returns. The ore averages from \$200 to \$270 net per ton. The mine was operated unsuccessfully by other parties, who endeavored to work the ore by the common free gold process. The Black Bear is located on Muleton mountain, and is owned by Judge Bell, Jos. Bell and Sheriff Hopping. Ore shipped has netted as high as \$600 to the ton. A shaft and short tunnel has been run, and recently a tunnel has been started to tap the ledge 200 feet deep. The Gray Eagle, also on Muleton mountain, is owned by Judge Bell, Sheriff Hopping, the estate of Geo. Knox, and Kahney, the brewer. A couple of shafts have been sunk, showing ore that will assay as high as \$600 per ton with a strong ledge. Prospects are favorable for a fine mine. The Price mine, at Centerville, is owned by Tom Price and shows some very good ore. There is very rich ore exhibited from the Sky Blue mine, near Middle Creek, owned by Biegle, Bugbee, Becker and Bouk. This mine is undoubtedly a continuation of the old Bunker Hill claim. Considerable work has been done and the ore is of high grade. The Pfeiffer mine, on Salt Creek, had on exhibition some very good ore. A small sample of ore was exhibited from the Thompson mine, located at the Swasey place. Considerable development has been made on this mine. Ore from the Trinity and Mollie mines, in the Dog Creek district, was very rich. These mines are owned by a large company, and thousands of dollars have been spent in putting up mill, erecting a boarding-house and building a road, but as the ore is not free milling, the managers are considering some process which will extract the gold from the ore, rich by assay. Silver ore was on exhibition from the Crystal, Black Prince, Wright & Son's location. These mines are located in South Fork district, near Igo. The Crystal is owned by Henry Rothwell, who has recently discovered some extra fine ore, assaying from \$700 to \$800 per ton. The Black Prince is a contiguous location, owned by Robinson & Sons, in which there has been recently some fine developments. J. P. Wright & Sons' location is also near the Crystal. It is a recent strike. The ore placed on exhibition showed up brittle silver, and is worth at least \$800 a ton. From French Gulch there was exhibited ores from the J. I. C., Wheeler and Gopher mines, all gold and rich. These mines are not fully developed, although considerable work has been done. They are contiguous to the Gladstone, a mine which is fast going to the front as a dividend paying mine. Matt Hume had ore on exhibition from a mine on Iron Mountain. The ore is good. It is owned by Hume, Dix and others. There were two mines represented from Flat Creek district—the Presenti and the Spelman locations. The former is owned by David Presenti and H. Cineschmidt. The ledge has been uncovered for about 75 feet, and a crosscut 32 feet has been run to strike the vein, and 34 feet has been run on the vein west. From cuts and shafts here and there, the ore

will average \$50 to the ton. The Spelman mine is owned by John Spelman and Dan Haskell.

Slakiyou.

QUARTZ.—Yreka Journal, Sept. 16: We learn that a rich quartz ledge has lately been discovered on Six Mile Creek, at South Fork of Scott river, above Callahans, by a man named Short. Twenty-five pounds of the quartz lately taken out was at least half gold, and caused considerable excitement at Callahans and vicinity. A man named Reibolt, from San Francisco, who bought an old condemned placer claim on the same creek a few years ago, has also found very rich prospects. Clark & Heckathorn, of Greenhorn, are finding very rich pay in their quartz ledge on Greenhorn, near the Big Spring. They have a body of decomposed quartz and paying dirt about six feet in width, prospecting to a depth of 15 feet and about 700 feet long, which pays not less than from \$5 to \$100 per day to the hand by washing in a rocker, and laying the hard pieces to one side for crushing hereafter in a mill. They have only water enough at present in the spring to work a rocker, but intend running a couple of trenches toward the summit of Deadwood mountain, so as to gain the benefit of the melting snow of winter in washing the decomposed quartz and ground in sluices. Chas. Lunger visited the Empire quartz mine last Saturday, at Klamath river, in which he has a force at work running a tunnel to strike the ledge lower down. The tunnel is now about 119 feet long, in very hard base rock, with expectation of soon being completed to the ledge. As soon as sufficient water is obtainable for running the mill, a large lot of quartz on the dump at the upper level will be crushed. The Allen Bros., of Quartz Valley, have been doing very well in their quartz mine this season by getting the quartz crushed at the old Johnson mill, near Mugginsville. The ledge averages about a foot in width, and yields from two to four ounces of gold per ton. They have just received hoisting machinery, which arrived at the Yreka R. R. depot this week, and is now being hauled to their mine by returning teamsters hauling wheat from Scott Valley. This machinery is operated by compressed air under the working of steam engine, and can also be used to good advantage in furnishing pure air in the tunnels if needed.

GRAVEL.—The shaft in the Yreka blue gravel claim is now down over 100 feet from the surface, with the ground of very tough like blue cement. As soon as softer ground is reached, it will be a very good indication of nearing bedrock. It was expected that bedrock was not over 100 feet down, and may come in sight before sinking many more feet.

GOLD.—The members of the Chinese Co., working the old Bentz Bar claim, Klamath river, just above Honolulu, are reported as taking out gold dust in great abundance, as rich as ever realized on that rich-yielding stream, but no one can get any figures, as the Chinamen "no sabbee." James Wheeler of Yreka visited the cinnabar mine on Siskiyou mountain last week, going by buckboard from Quigley's on Klamath river. He brought several specimens of cinnabar to town, which, on being pounded in a mortar and washed in a pan, exhibited an exceedingly rich prospect. The furnaces are about completed for commencing the reduction of ore, but the machinery for retorting has not all been received yet. Hard wood is to be used principally in the furnaces.

Trinity.

NEW RIVER.—Cor. Trinity Journal, Sept. 19: Our energetic and enterprising miners are busy at work every day, penetrating the bowels of the earth in search of lucre. F. Colegrove, the worthy superintendent of the Excelsior mine, is very much elated over a rich streak of ore he discovered about three weeks ago. Bowerman & Fillmore, who have a lease of the Excelsior, have several men employed in getting out ore, and manage to keep their mill in motion day and night. The Mountain Bomber mine, owned by Clement & Ladd and leased by Leas and Nickolson is producing abundance of rich ore this summer, thereby giving Mr. Ladd, who runs the Mountain Bomber mill, sufficient ore to keep him busy almost day and night. The Ridgeway Gold Mining Co.'s (consolidated) mine under the able management of its venerable superintendent, Maj. W. Toms, has quite a number of men engaged, and has been running a magnificent ten-stamp mill very successfully since they started up, six weeks ago. Notwithstanding that they run only 12 hours per day, yet they crush 15 tons of ore daily, and after they get to running day and night, which they expect to do in the near future, they say they can grind 30 tons daily.

Tuolumne.

VERY ENCOURAGING.—Sonora Democrat, Sept. 19: The Badger mine, owned by W. G. Martin of Rawhide and T. M. Yancey of Sonora, and which is under bond to J. Sevenoaks of San Francisco, is rapidly being developed at the 200-foot level, a drift being run north. In the face of said drift is $4\frac{1}{2}$ feet of ribbon rock which will mill \$40 a ton in gold and \$20 in silver. There is a tunnel running to intercept the shaft 800 feet away north, coming south, which will cut the vein 300 feet from the surface. Upon the whole, this is considered one of the best mines that has ever been opened in Tuolumne county.

MISSSED.—The amount of money put in circulation by the working of the Bonanza and San Giuseppe mines is readily missed since the stopping of those mines. It is estimated that no less than from \$1000 to \$1500 was paid out for labor on and supplies to these mines each month. However, the mines are valuable properties and will not be permitted to remain unworked for any length of time.

NEVADA.

Washoe District.

SAVAGE.—Virginia Chronicle, Sept. 17: During the week we have boisted 598 cars of ore from the 500, 750, 950, 1100 and 1400 levels, shipped to the Nevada mill 555 tons and milled 335 tons, average assay value as per battery samples of \$20 a ton. We have built on band amounting to \$14,636 30. On the 1500 level the north lateral drift from the Hale & Norcross side was advanced 20 feet; total distance, 130 feet from our south boundary. Face is in quartz, showing some fair grade ore. Ten feet back from the face of the north drift we have started east and west crosscuts.

HALE & NORCROSS.—On the 1500 level No 3

west crosscut was advanced 25 feet; total length 160 feet; face in porphyry. Winze No. 2, started at the end of No. 2 east crosscut, is down 83 feet. From this point we have started a west prospecting drift, which is advanced 8 feet. The main incline is repaired and retimbered 190 feet below the 1500 station and we will commence this week to open the 1630 level.

CROWN POINT.—South drift from west crosscut on the 500 level has been advanced 15 feet during the week and is now out 62 feet. At this point it was stopped temporarily and an east crosscut started from the end. This crosscut is now out 23 feet and has passed through a width of 4 feet of quartz giving low assays.

KENTUCK.—Have sunk the winze from the north crosscut on the 1000 level 4 feet during the week and it is now down 21 feet; the bottom is in low-grade quartz. Are still following the ore streak above the south drift from the north raise 1000 level which varies in width from one to two feet of rock that assays from \$20 to \$25 per ton. Have started a north drift from the Crown Point west crosscut on the 500 level to explore our ground in this direction.

JUSTICE.—The south drift No. 1 crosscut, 822 level, was advanced 9 feet during the week; total length 21 feet; face in low-grade quartz. The north drift on this level is out 826 feet, having been advanced 19 feet since last report; face in fair-grade ore.

BELCHER.—The west crosscut from the south drift from the 200 level has been advanced 5 feet during the week and is now out 77 feet. At this point it was stopped and a west crosscut started on the track floor at the foot of the raise and which is out 28 feet; face is in low-grade quartz, containing occasional spots of ore.

IMPERIAL.—The east crosscut on the 400 level is out 53 feet; face shows clay. Raise No. 3 from the 500 level is up 22 feet, having been commenced during the week; the top shows quartz of no value.

SEG. BELCHER.—The west crosscut from the south lateral drift on 600 level has been advanced 22 feet since last report, and is now out a total distance of 350 feet. The face of the drift is in porphyry, with considerable water running from it.

YELLOW JACKET.—No ore is being shipped, since milling is arrested on account of low water in the Carson river.

SCORPION.—The joint north drift from the 900 level of the Union shaft was advanced 24 feet, making its total length 447 feet; face in clay and porphyry.

CONFIDENCE CHALLENGE.—The joint Confidence-Challenge, west crosscut on the 230 level is now out 73 feet, face shows quartz of no value. North drift on the 300 level is in 423 feet; face shows quartz of no value.

CHALLENGE.—The joint Challenge-Imperial west crosscut on the 1100 level is out 166 feet, 20 feet having been made during the week; face shows a mixture of quartz and porphyry.

Jefferson District.

NUGGETS.—Belmont Courier, Sept. 16: James T. Darrough of Smoky Valley showed us on Monday last a number of gold nuggets and some gold dust which were found in Jefferson Canyon, Nye county. Mr. Darrough says that gold-bearing quartz has also been found and he believes that the owners of the claims will, in the near future, strike the ledge from which the quartz is supposed to come. He also states that Messrs. Stebbins and Corrallo, who are working the placer claims, have thus far made wages. It has been known for several years past that gold exists in Jefferson district.

Pahranaagat Lake District.

PROSPECTING.—Pioche Record, Sept. 5: Pahranaagat Lake Mining district, 60 miles west of here, is still heard from, though the boom looked for two years ago has so far failed to materialize, on account of the cessation of work by the U. P. folks on their road. But the few nervy prospectors still left in the district believe firmly in the future of that section and propose to see it come. The Balback mine owned by Henry Sharp Jr., is coming into prominence. The mine was bonded last year to Messrs. Barber & Silvia for six months, who prepared to work it, but ended with cleaning out the old drift and shaft, when they threw up the bond and left. Since then Sharp has worked the claim and now has a nice vein of ore exposed and the mine is withdrawn from the market. On this claim at the end of a 125-foot cut and drift, a winze is sunk some 60 feet on the ledge. Thirty feet down, a drift runs west 15 feet, showing 20 inches of high-grade ore. At the bottom of the winze, drifts run east and west. The east drift is in 15 feet, where 18 inches of ore running 200 ounces in silver per ton is seen. The west drift is in 30 feet and the whole face is ore, and has been for the last eight feet. This ore runs 80 ounces in silver per ton. There are 20 tons of ore on the dump and 20 more in the mine ready to hoist. This will be sorted down to about eight tons, to run about 230 ounces per ton, which will be shipped to Salt Lake. The balance will remain on the dump until a better market offers. On account of the distance nothing much under 80-ounce ore will pay to ship from that district. J. B. Gilbert has struck a nice vein of silver lead ore in the Carbonate claim which he located last January. Ore was found a short distance from the surface, and he now has a carload nearly ready for shipment, which will average 80 ounces silver per ton, and carries about 40 per cent lead. Lee Routzong is following down a rich seam of sulphide ore on an old relocated claim in Silver canyon and expects soon to make a small shipment. He is on a side vein, but is sanguine of encountering the main ledge soon. John Purtscher and J. C. Henderson are busy doing assessment work on claims they own there and have encouraging showings in a number of them. Mr. Sam'l T. Goodbe has let a contract to sink 50 feet on the old Buckeye claim on the north side of Silver canyon, and work will begin at once. This is the mine from which Howell and Lytle, five years ago mined a large quantity of high-grade ore, and which was milled there, their operations ceasing for lack of funds when the ore body pinched. It is confidently expected that the new work will result in a good find. Irish mountain, where all the above claims are located, is several miles in length, and it is boneycombed with ore veins and ledges and it only requires an expenditure of capital to make it one of the best mineral producers which this section of country has known. This may not be properly undertaken until a railroad is at hand to assist, but that time bids fair to come soon.

ARIZONA.

STOCKTON HILL.—Mohave Miner, Sept. 17: M. W. Scott and Dan Haskins have a lot of rich horn silver rock ready for the smelter which they will ship to Kingman next week. This ore is from the Esperanza, a fine mine near the old "og," long famous for its rich horn silver, and the Esperanza bids fair to become just such another bonanza. Messrs. Haskins and Scott purchased it last summer from George Lockwood and have had good ore in sight from the start. They have been working like beavers and deserve their good fortune. The assays run away up, and they will realize a snug sum from their shipment next week. They intend to work this property all winter.

ONYX.—Prescott Courier, Sept. 16: Messrs. Mason and Fisk, mining men from Los Angeles, leave to-day for the Big Bug onyx fields with a view of looking into the feasibility of handling the output of this remarkable deposit of valuable ornamental stone. It is said to be their intention to ship two carloads of onyx to San Francisco to be worked into various articles, but much of it will be used in finishing the inside of the famous Baldwin hotel. With cheaper transportation, which we will certainly have in the near future, the onyx industry will furnish its full quota to our material prosperity.

BRITISH COLUMBIA.

THE SKYLINE CROSSCUT IN ORE.—Ainsworth Hot Springs News, Sept. 12: For a month past, every claim owner in Hot Springs district has been anxiously awaiting the news that the crosscut from the bottom of the Skyline shaft had reached the vein. When the crosscut was started it was thought the vein would be reached within 50 feet, but that distance was run without encountering more than small stringers of galena. The rock turned extremely hard, and progress was slow. This week the face of the crosscut is in vein matter that assays \$63 to \$70 in silver, and is similar to that found on the hanging wall in the old incline shaft. Supt. McDonald is confident that he has the ledge, and his confidence in a great measure, is catching. The crosscut taps the ledge (on the incline) fully 200 feet from the surface. It is reported that the owners of the Skyline will now begin work on the Krao, on which they have machinery. They are also doing considerable work on the Libby, a promising claim on Cedar creek.

CONTINUES TO MAKE ORE SHIPMENTS.—The only mine in the Kootenay Lake country that is shipping ore at present is the Number One in Hot Springs district. So far about 150 tons have been shipped, the last shipment of 35 tons being sent out this week by the steamer Nelson. The ore goes to the smelter at East Helena, Montana, via Little Dalles and Spokane.

COLORADO.

A GREAT PLANT.—Aspen Times, Sept. 19: Fully \$250,000 is being expended by W. S. Morse, E. R. Holden and R. Cline in building the lixiviation works at Aspen. Everything about the establishment is of the most substantial nature. These men mean business. Manager Morse says they will start out by charging in the neighborhood of \$10 a ton for treating ores to make sure of a financial success, but after a while may be able to cut that a little. Even this will save \$5 to \$8 per ton to the miner, and as the works will handle ore that does not run over \$25 to the ton, 150 tons a day of Aspen's ores that now has no market will go into the general output. This will cause to be opened many new ore bodies. As soon as the works are under successful operation and the lower grade output sufficient to justify, these gentlemen will increase the capacity. Aspen can stand it if they extend the plant clear to the mouth of Castle creek. They are here to make money, but by so doing Aspen will receive great benefit and cheer them on. Capital is what makes prosperity for all and should receive every encouragement.

DAKOTA.

THE ORE TRAIN.—Deadwood Pioneer, Sept. 16: The advertising ore train which is being gotten up by the Elkhorn Railroad, will leave to-morrow morning for Omaha. The cars will be decorated, and streamers will announce to the astonished grangers of Nebraska that the ore comes from the Black Hills. Among the mines from which ore will be taken are the Buxton, Ross-Hannibal, Portland, Tornado, Retriever, Calumet, Golden Reward, Harmony, Double Standard and Mark Twain. Transportation will be furnished the shippers, who will go to Omaha on the regular passenger train.

THE GRADING CONTRACT LET.—Yesterday the contract for grading the site of the new chlorination works was let to Joseph McLaughlin, who has had numerous contracts on the Elkhorn.

IDAHO.

ATLANTA.—Elmore Bulletin, Sept. 15: Abner Hall returned last Monday from a visit to Atlanta. He says the Big Lode tunnel was then in a distance of 300 feet and advancing at the rate of five feet per day. Culp and Anderson, at a depth of 60 feet, were drifting east in good ore. Brown was much encouraged and pushing work on the Last Chance and also getting in winter's wood for running the mill. George Tims had his regular force of men at work extracting good ore from the Tims mine and expected to soon make another successful run at Col. Miller's mill. Struckman, after a short run in his placer claim, was preparing to clean up, and with every indication of making good wages. Louie Frank, McCabe and Lewis are still taking out good ore from their Yuba claim.

BUNKER HILL AND SULLIVAN.—Wardner News, Sept. 16: On Wednesday the Bunker Hill and Sullivan tramway was again put in motion, and since that time has been removing the vast accumulation of ore contained in the bins. Work is progressing in the mines, but at present a force of between 30 and 40 men is only employed. Next week the mammoth concentrator will resume operations and a largely increased number of men will once more be placed upon the pay-roll.

THE STEMWINDER MINE.—Operations in and around the Stemwinder mine are actively progressing, and in the near future that most valuable property will once again take its place among the

famous ore-producers surrounding Wardner. The mill has been enlarged to double its former proportions, and has now a capacity of 120 tons per day. Development work in the mine has been going on continuously, and when the tramway is completed the company will employ in mine and mill a force of 70 men.

MINING ON THE RESERVATION.—Little has been said as yet of the mineral discoveries on the Coeur d'Alene reservation from the fact that since the locating of claims north of Lane Station, on Lake Killarney, nothing has been done in the way of development except upon one group of claims known as the Black Wonder White Quartz and Mugwump, located by A. H. Posten & Co. of Spokane. Their lead shows 27½ feet of concentrating ore between the walls, assaying 34 ounces silver and 65 per cent lead. These gentlemen have been engaged all summer in developing this property, with gratifying results. They are now down over 100 feet, and they keep several men constantly employed in continuing the work of sinking. The claims are located three miles from the head of Lake Killarney, between Silver and Galena creeks, and from all appearance they promise in the near future to rank among the large silver producers of the Northwest.

MONTANA.

BLUE BIRD.—Inter-Mountain, Sept. 16: The Blue Bird mine and mill is now under the charge of Assistant Manager Adams, General Manager Kellar having gone to Denver. The mill is kept amply supplied with ore from the Blue Bird mine. The cooling floors have been doing perfect work, as well as the leaching process, the only one of the kind in the State.

CARE AGAINST CAVES.—In most of the mines the waste is used for filling in the old stopes. In times gone by this was considered unnecessary, but as depth was attained and the ledges found to continue in depth the timbers above began to show signs of weakening, and then would come a cave and filling in the mine is made secure, second only to the solid. In all the mines of any magnitude this method is wholly adopted. The Anaconda when in full operation runs crosscuts off into the solid to procure filling though formerly they resorted more to the use of timbers and only with what waste was procured in the mine, then a cave came when a lesson was learned at a great cost. The Boston & Montana mines are carefully guarded in this respect, not like the old management before coming into the control of the present company. In some of these same mines it was so that the cages could be hardly pulled through the shaft, where now they are a picture of mining for the world to come and witness.

WORK ABANDONED IN THE LION.—Butte Inter-Mountain, Sept. 16: The Lion Mining Company of the Oro Fino District has abandoned the workings in the Lion mine. The pumps have been drawn and work will not be resumed until some other property has demonstrated that the work will pay. There is still a small vein of very rich ore in the face of the drift, but the owners have tired of paying assessments and the ore does not justify them in working the property. Many of the stockholders have confidence in the mine, in fact very rich streaks and pockets of ore have been found in it, and it may be leased and further developed by outside parties. Captain J. W. Plummer, who experted it recently, said "that it was as a prospect a good showing, and as a gamble was a first-class investment for speculators."

NEW MEXICO.

ORE SHIPPED.—Southwest Sentinel, Sept. 15: John Bragaw brought over a carload of ore from his McGregor mine last Tuesday for shipment to El Paso. James Carr's big freighting outfit is now engaged in hauling ore from the Bennett-Stephenson mines in the Organ mountains to Las Cruces. The M. & M. Co. is receiving ore at the Bremen mill, and its new pump arrived last Saturday. Everything will be gotten in readiness to start up when there is a sufficient supply of ore on hand to keep the stamps dropping for several months. The Mangus M. Co. is steadily developing its mines with a small force of four men. The vein shows up from 2 to 6 feet in width. Only the first-class ore taken out in development is shipped; the rest is piled up on the dumps waiting till the company is ready to put up a mill or till the Flagler Reduction Works get into operation.

OREGON.

PLACERS YIELDING HANDSOMELY.—Bedrock Democrat, Sept. 1: The Democrat yesterday morning received a call from Mr. Isaac Klopp, one of the most experienced miners in this section. The gentleman stated that the mining outlook for his district was never brighter. Of the different properties in the Granite district he speaks as follows: Klopp & Baisley have been running two pipes all summer on the North Fork placers, and from a partial cleanup from one pipe upward of \$3000 was realized. A like cleanup is expected from the other. Woods, Goodrich & Co. are working their diggys and good returns are anticipated. Messrs. Gallagher & Looney and Niven & Dittmars have one pipe at work on their placers and a good cleanup will follow. McLean, Monroe & Co. commenced working their placers a few days since, the ditch having just been completed. Goodrich & Co. are at work constructing a ditch. Their placers promise good returns. John Hughes & Co., the owners of the Standard, a fine quartz property, situated two miles north of the Monumental mine, are pushing development work vigorously ahead. The Whiteman mine, owned by Whiteman, Rotchild & Co., is undergoing extensive development and a large amount of good rock is being taken out. The Buffalo, the property of a Pendleton company, is showing up fine. A 400 foot tunnel is being run, which will tap the vein at a considerable depth. Madeau & Tibbedo, who have been operating their Trail Creek placers during the past season, are making their final cleanup. James Cates is working his valuable diggings on Onion creek, and will make a good cleanup. J. C. Powers & Co. have a force of 15 men running a tunnel in on the Intrinsic, Greenhorn district, which will tap the ledge at a depth of 500 feet. A large number of prospectors are in the Greenhorn country and new strikes are of daily occurrence. This is without doubt the coming mining district of the Northwest.

MECHANICAL PROGRESS.

MAKING AND TEMPERING SPIRAL SPRINGS.—When the steel spiral spring of an instrument gets broken, it is much more satisfactory to make one than to send the instrument off and be without it for a week or more. To make them, use the best spring steel wire; select a smooth iron rod the size of the spring to be made. Carefully draw the temper from the wire; fasten the rod and one end of the wire in a bench vice. Now wind the wire evenly and closely around the rod until you get the length of the wire required for the spring. Take the rod out of the vice; fasten one end of the spring to the rod, taking hold of the other end. Draw it along the rod until the spirals are the correct distance apart. To give the amount of spring wanted, fasten it firmly to the rod, then make the spring and rod red-hot, and quickly plunge them into cold water. After drying, rub them all over carefully with oil, and move them about in the flame of a lamp until the oil takes fire, which will give the spring the proper temper. I know there are some who make springs direct from tempered wire; but they are much more durable if shaped and then tempered.—*Dr. Wm. H. Steele.*

NICKEL STEEL.—Having regard to the superior excellence of nickel steel armor plates, which has recently been demonstrated, it may not be amiss to quote the remarks of a recognized French authority, M. Mercadier, bearing on the elastic properties possessed by nickel steel. This gentleman, who has spent many years in investigating the subject, is of opinion that steel alloyed with nickel is destined to play a still greater role in the metallurgical world. By means of the acoustic method which he has invented, M. Mercadier finds that steel containing nickel in the proportion of 25 to 100 is perfectly homogeneous and almost completely isotropic. The incorporation of the nickel with the steel in sufficient quality, he adds, while increasing the homogeneity of the material, imparts to it an isotropy similar to that of the belles glaces of Saint Gobain. This result, interesting from a theoretical point of view, is also of importance in consideration of the practical industrial lessons that may be deduced therefrom.

COPPER STEEL ALLOY.—The Hartstedt Furnace and Refining Co., have patented a process for producing, either in an crucible or on the open hearth, steel containing variable proportions of copper, and propose applying the metal to the manufacture of cannon, armor plates, projectiles and other war material. The process consists in employing ordinary copper or copper pig, avoiding oxidation of the copper before its alloy with the steel. The copper or the copper pig is introduced either at the commencement of the fusion in the interior of the bath protected by the bed of Aluminum Alloy Composite or at the end, in the moment of adding the recarbonizers. By this method is obtained a steel containing from two to four per cent and one tenth of Aluminum which is stated to possess remarkable qualities of elasticity, resistance and malleability.

STEEL CENTER SILLS FOR FREIGHT CARS.—Recent talks with progressive railroad men lead the *Railroad Gazette* to believe that the time is not far distant when a trial will be made to show the utility of steel center sills in freight cars, and there is every indication that the next decided change in car construction will be lowering the car floor and placing the draw bar between the center sills. With this it is expected will come a trial of steel channels for sills. Two roads are already seriously considering this, and have made estimates of the difference in cost. The price at which steel channels for this purpose are offered is but little more than is paid for steel rails, and at such rates the increased cost of a steel center sill is extremely small and all out of proportion to the probable advantage to be obtained.

COLD WELDING.—The following is given as a mixture for joining pieces of iron together: Equal parts of sulphur, alloy composite and white lead, with about one-sixth proportion of borax, are the constituents of the mixture, and they should be thoroughly incorporated together, so as to form one homogeneous mass. When the composition is to be applied, it should be wet with strong sulphuric acid, and a thin layer of it placed between the two pieces of iron to be connected, these being at once pressed together. The *Chemical Trades Journal* says: "It is stated that the cement will hold so firmly as to resist the blows of a steam hammer, and dry so completely in a few days as to leave no trace of the cement, the work then presenting the appearance of welding."

A YOUNG MECHANIC should remember that the mechanic who studies and thinks, who seeks good society, who is clean in person, who is self-reliable, industrious, obliging and courteous, is the mechanic who is bound to rise in his profession. Remember also, the reverse, that the mechanic who never studies or thinks, who seeks low associates and indulges in vicious dissipation, who is slovenly, slouchy and unpleasant in person, who is shiftless, discontented, disconcerting and disobliging, is the future inhabitant of the gutter, the grogery, the almshouse and the prison, and the future occupant of a pauper grave in the potter's field.

A MOST INGENIOUS CONTRIVANCE for separating bits of iron from dirt and rubbish was recently exhibited at an English agricultural fair. This separator is made up of a hollow truncated cone equipped with ten internal magnets of opposite polarity. The refuse is fed into the back end of the cone as it revolves, and gradually rolls to the front and out into a chute, passing over the magnets from 100 to 150 times. Each magnet is magnetized as it comes to the bottom, and remains so until reaching the highest point in the revolution, when it is demagnetized, and the bits of iron gathered from the refuse fall into a tray. An electric current of 600 Watts is required for a machine capable of dealing with four tons of refuse per hour.

MECHANICAL ENGINEERING.—Prof. George H. Bryant of the Alabama Polytechnic Institute has been appointed Director of the Workshops and Assistant Professor of Mechanical Engineering in the Leland Stanford Jr. University. Mr. Bryant graduated from the course in mechanical engineering at the Massachusetts Institute of Technology in Boston in 1883. He established the workshops at the Alabama Polytechnic Institute and has been in charge of the instruction in mechanical arts in that institution for the past six years.

AN IMPROVED LEAD-HEADED NAIL, for use in putting on corrugated iron roofs, has made its appearance in the market. The shank of the nail is round and sufficiently sharp at the points to enter the wood readily, and may be driven home in the usual way. The head flattens under the blows of the hammer, or a punch may be used which will give it a conical head. The lead of the head comes in contact with the sheet iron in such a way as to lessen the chance of leaking.

STEEL AXLE BOXES.—A foreign firm has recently patented a machine which does away with a large annual loss, by making a wrought steel box that is not expensive. The steel is delivered to the machine in plates a half-inch thick, and the box is produced by a series of presses which cut the metal to the required shape, and the machine then folds the pieces to form the box. The boxes are much stronger and much lighter than the old style cast iron boxes.

A GOOD MAN VS. A GOOD MACHINE.—A good man is worth what he gets, but seldom gets what he factually deserves. A good man, like a good machine, is always worth good money. The better the man the better value he gives you. The better the machine the better results in production and efficiency.

LONG SHAFT.—What is stated to be the longest shaft in the world is that in the navy-yard at Washington, D. C. It is used in the transmission of power to traveling cranes, is 460 feet in length, 3½ inches square and runs 160 revolutions per minute.

A NEW INVENTION that is said to be an important one in the sheet-iron industry consists in the substitution of automatic machinery for hand labor for picking and galvanizing the sheet iron and passing it to the packers.

The Present Law on Desert Lands.

It is shown that the desert lands are henceforth to be held more tightly in hand by the Government. Commissioner Carter of the General Land Office, under date of August 31, 1891, has written a long letter to the Register and Receiver of the Susanville Land Office, in which, according to an abstract in the *Chronicle*, he recited the provisions of the special Laseen county act of 1875, the general desert land act of 1877, and the revised law of March 3, 1891. As the latter act provided that all laws and parts of laws in conflict therewith were thereby repealed, the Commissioner holds that the special Laseen county act is no longer in force, and that all filings made under it since March, 1891, are void and must be canceled.

Under the amended act, any person filing on desert land can claim no more than 320 acres. At the time of filing he must also furnish a map showing the sources from which he intends to obtain water, and must also pay in cash 25 cents an acre. Each year for three successive years at least \$1 an acre must be expended in obtaining water, and after such expenditure the further payment of \$1 an acre is necessary in order to obtain title. Proof is required in addition that at least an eighth of the land taken up has been put under cultivation.

In filing under this law it is also required that the person making entry swear to the fact that he has been on the land and knows of his own personal knowledge that it is desert in character.

FORESTS AND PURE AIR.—A Parisian scientist, while testifying to the greater purity of the air in the vicinity of forests, does not attribute the cause to a greater richness in oxygen, the quantity of the latter being the same in the atmosphere of woods as in plains, but to the absence of those agents which vitiate the atmosphere of towns. When forests are not surrounded by marshes, a well treed region is next to exempt from epidemics. Versailles is a case in point. It is surrounded by a screen of forests; epidemics are unknown, yet the city has most wretched water.

SCIENTIFIC PROGRESS.

SOUNDS FOCUSED BY SHIPS' SAILS.—It is a well-established fact that the wide-spread sails of a ship, when rendered concave by a gentle breeze, are most excellent conductors of sound. The celebrated Dr. Arnott relates the following circumstance as a practical proof of this assertion: A ship was once sailing along the coast of Brazil, far out of sight of land. Suddenly several of the crew, while walking along the deck, noticed that when passing and repassing a particular spot they always heard with great distinctness the sound of bells chiming sweet music, as though being rung but a short distance away. Dismayed by this phenomenon, they quickly communicated the discovery to their mates, but none of them were able to solve the enigma as to the origin of these seemingly mysterious sounds. Several months afterward, upon returning to Brazil, some of the listeners determined to satisfy their curiosity. Accordingly, they mentioned the circumstance to their friends, and were informed that at the time when the sounds were heard, the bells in the cathedral of San Salvador, on the coast, had been ringing to celebrate a feast held in honor of one of the saints. Their sound, wonderful to relate, favored by a gentle, steady breeze, had traveled a distance of upward of 100 miles over the smooth water, and had been brought to a focus by the sails at the particular locality in which the sweet sounds were first heard. This is but one of the several instances of a similar kind, trustworthy authorities claiming that it has often happened under somewhat similar circumstances.

ZINC PROCESSES.—Three different processes, each believed to possess its peculiar advantages, are in vogue among the manufacturers of zinc in Europe. In Belgium, to get pure zinc from the oxide, the latter is mixed with coal and heated in a retort, the zinc volatilizing and coming out of the mouth of the retort as a vapor; cadmium is always with the zinc, and cadmium vapor comes out first, and, when lighted, burns with a brown flame, the latter changing to green as soon as the zinc vapor begins to come off, an iron cap is then placed over the mouth of the retort, through which the vapor passes and is condensed into a fine dust, and gradually the cap becomes hot and melts the dust into liquid zinc, which runs into molds and is cast into blocks. The Silesian process differs from the foregoing only in the retort, the mixture of ore and coal being put in and heated, and the vapor passing out through a tube bent at right angles to the retort; the tube is kept cool, but not cool enough to condense the vapor into solid zinc, as, if this should happen, the pipe would become clogged and the retort would burst. In the English process, the retort consists of a tightly covered crucible, through the bottom of which passes a pipe; the pipe is stoppered with a wooden plug, and the mixture of ore and coal is put into the crucible and heated, and as the mixture grows hotter, the plug is converted into charcoal, allowing only the zinc vapor to pass through it.—*Ez.*

AN ILLUMINATED GUN SIGHT.—There is now in use upon many English war ships an illuminated gun sight, by which a gun may be more accurately sighted. The sights consist of a cone of a pale-green glass, set point up on the muzzle of the gun. Beneath this cone is a small incandescent lamp; the other light, on the rear of the gun, is similar in principle, except that in place of the cone there is a metal cross bar with a V notch in the middle, and upon the under surface is highly polished, and from which the light which first passes through ruby glass is reflected. In sighting, the green point of the forward sight is brought into coincidence with the line of ruby light at the bottom of the notch on the rear sight. A battery of two elements furnishes the current for the light for each gun, and is arranged so that by turning it upside down its action may be stopped.

WHY A GLASS CHIMNEY MAKES SO MUCH DIFFERENCE IN THE LIGHT GIVEN BY A LAMP. The chimney has the effect of heightening the light of a lamp because it increases the supply of oxygen to the flame by producing a draft, and concentrates and reflects the heat of the flame, in consequence of which the combustion of the carbon is more perfect and very little escapes unconsumed. Lamp glasses were invented by Alme Argand, the inventor of the famous lamp and gas burner which bears his name. He has been experimenting for some time in trying to increase the light, but to no purpose. On the table before him lay the broken neck of an oil flask. This he took up carelessly and placed it, almost without thought, over the wick. A brilliant flame was the result, and the hint was not lost upon the experimentalist, who proceeded to put his discovery into practical operation at once.—*Ez.*

THE CORROSION OF IRON.—Some experiments were recently made at the Riverdale Iron Works, Wheeling, West Virginia, on the comparative liability to rust of iron and soft Bessemer steel. A piece of iron plate and a similar piece of steel, both clean and bright, were placed in a mixture of yellow loam and sand, with which had been thoroughly incorporated some carbonate of soda, nitrate of soda, ammonium chloride and chloride of magnesium. The earth as prepared was kept moist. At the

end of 32 days the pieces of metal were taken out, cleaned and weighed, when the iron was found to have 0.84 per cent of its weight and the steel 0.72 per cent. The pieces were replaced, and after 28 days weighed again, when the iron was found to have lost 2.06 per cent of its original weight and the steel 1.79 per cent.

A CURIOUS PROPERTY OF SULPHUR.—M. Charles Lepierre states that in demonstrating that sulphur, melted at about 115° C., can be cooled on paper. He happened to use a lithographed card of which the edges were turned up. Upon taking away the card he discovered that the lithographed characters were clearly and distinctly impressed upon the cooled surface of the sulphur, and remained after hard friction and washing. By repeated experiments he has been able to get very fine results, removing the paper each time by a mere washing and rubbing process. He finds that sulphur will receive impressions from and reproduce faithfully characters or designs in ordinary graphite crayon, colored crayons, writing ink, typographical inks, china ink, lithographic inks (colored or uncolored) and others. He remarks, too, that it will reproduce with remarkable exactitude geographical maps.

RESISTANCE OF METAL.—H. L. Chatseller, according to the *Moniteur Scientifique*, has applied to a new series of metals and alloys the same method which he used to determine, by means of the electrical resistances, the molecular transformations in metals at high temperature. His conclusion is that the metals which show no molecular transformation before fusing, have electrical resistances whose variations are a linear function of the temperatures, have sudden variations in their law of growth. Some alloys show progressive molecular transformation which, for the most part, take place within certain limits of temperature and are not sudden. The variations of electric resistance for iron, aluminum and their alloys, at temperature above that of transformation, follow a law which is analogous to that of platinum and its alloys.

A GIGANTIC RELIEF MAP OF THE UNITED STATES.—A geographical novelty has been produced by Prof. Edwin E. Howell of Washington, D. C., namely, a large relief map of the United States and Gulf of Mexico, with portions of the Atlantic and Pacific oceans, between the 67th and 127th meridians, modeled on the section of a globe 133 feet in diameter. This great work is prepared from data furnished by the United States Geological Survey, the United States Coast and Geodetic Survey, and the United States Hydrographic Office. The horizontal scale is 1 inch equal to 50 miles; and vertically 1 inch equals 5 miles. The dimensions of the map are 6 feet 5 inches by 4 feet, and it is about 15 inches in its greatest thickness. The first copy of this important and artistic work has been secured by Mr. David Pell Secor, for the Bridgeport Scientific society.

ALLOY FOR HERMETICALLY CLOSING GLASS TUBES.—It is claimed by F. Walter that an alloy consisting substantially of 95 per cent of tin and 5 per cent of copper, may be used for connecting metals with glass, for electrical and other purposes, hermetically sealing glass tubes etc. The alloy is prepared by pouring the proper proportion of melted copper into the molten tin, stirring round with a wooden stirrer, casting or granulating and remelting. It adheres strongly to clean glass surfaces and has nearly the same coefficient of expansion as glass; it melts at about 350° C. By alloying it with 0.5 to 1 per cent of lead or zinc, it may be rendered softer or harder or more or less easily flammable as required. The alloy may also be used for coating metals or wires, as it imparts to them a silvery appearance.

STRENGTH OF WATERPROOF BRICKS.—Recent experiments on the strength of them have resulted in demonstrating a resistance to crushing of from 5000 lbs. to 22,000 lbs. per square inch, according to the quantity of the bricks. The average of ten varieties was 7150 lbs. per square inch. As the standard strength for bricks given by most engineering text-books is only from 500 lbs. to 5200 lbs., it is supposed that great improvements in the manufacture of bricks must have been made since these books were compiled. Bricks impregnated with coal tar are reported to be rendered hard, durable and perfectly waterproof.

THE DYNAMIC POWER OF COAL.—A curious and interesting calculation has been made by Prof. Rogers of Washington, D. C., on the dynamic power of coal. According to the professor, a single pound of good steam coal has within it dynamic power equivalent to the work of one man for one day. Three tons of the same coal represent a man's labor for a period of 20 years, and one square mile of a seam of coal, having a depth of four feet only, represents as much work as one million men can perform in 20 years.

CANDLE-POWER, which is used as the standard of illuminating efficiency, means the light of a sperm candle, seven-eighths of an inch in diameter, burning at the rate of 123 grains per hour.

PROF. DOLBEAR has magnetized a cambric needle by placing it for ten minutes in the focus of a beam of circularly polarized light which passed it longitudinally.

ELECTRICITY.

Our Electrical Department.

Recognizing the growing importance of the manifold uses of electricity in connection with our industrial pursuits, together with the rapid improvements in electrical appliances and inventions, the publishers of this paper have already introduced and will continue a more full detail of progress in this comparatively new and important industrial science.

Electricity and its rapid introduction into our industrial pursuits and into almost all our domestic and municipal requirements, as well, renders it necessary that people generally should keep well-informed on the subject by constant observation and study. It will be the effort of the publishers of this journal to meet just this want, and furnish information, which shall be more particularly needful to the general reader; leaving the few who are especially devoted to advanced study and expert investigation into the mysteries of this new science to those journals which are exclusively devoted to such inquiries.

All new advances and applications of electricity will be promptly announced and described in these columns. Our efforts will be directed to a weekly summing up and restatement, in a condensed form, of the latest achievements in the practical appliances of electricity—to a bringing together in convenient shape and in language which may be readily understood, information that may be widely scattered through the ordinary periodicals of the day or hidden in the recondite language of purely technical hooks and papers.

Our many friends and readers who are more or less interested in electrical inventions, systems and appliances, will thus find these columns convenient for reference and study; and communications on correspondence of interest in this direction are especially solicited.

New Electrical Devices.

New devices for the application of electricity are constantly being announced. We append quite a list of such inventions, all of which are of more or less importance in the various fields of industry and afford a most striking illustration of the activity of invention which is being turned in this direction.

Perhaps one of the most important, not to say most sensational, developments in this direction is the asserted discovery announced by Mr. Nikola Tesla, a young Hungarian, who has been pursuing his investigations and experiments for several years in this country. To state it in the fewest words, Mr. Tesla shows an electric lamp which glows without contact of wires or direct current, but simply by induction. This illuminating tube or bulb may be carried about in the hand, placed on a table, or used in any manner, within the field of electric influence, with greater safety than a lamp or even a candle. The interest of this discovery does not lie wholly in its curious and almost faulsh character, but in the prospect which it gives of the opening of a new field for the development of the possibilities of electricity.

A new electric underground system for electric street railways is being worked out in Chicago, which consists of two bare conductors carried in a conduit below the track, the conductors being placed to one side of the conduit where they are supposed to be protected from water entering the slot, contact being made by a bar which projects through the slot, the switch being located on the platform above. If the scheme is put into practice and proves to be what is expected of it, some electric roads will soon be built in the business portion of that city.

An electric carriage is the latest novelty, which has been recently introduced in London. One of these carriages is now being constructed in Brooklyn from photographs taken of the London vehicle.

A device for controlling electrical lights is reported by a Massachusetts man, which consists of a switch for electrical lamps, by which the consumption of electricity can be controlled. For instance, a 16-candle power lamp can be so regulated by this switch as to produce a light all the way from 16 to one-half candle power. The fact that the size of the light and the consumption of electricity could not be controlled without changing lamps, and the consequent greater expense than was necessary at all times, has kept many from introducing electricity into their houses. This objection overcomes, electricity for domestic lighting purposes should come into more general use.

An electrical fire engine has been invented, which is operated entirely by electricity, both in the forcing of water and a means of propelling the machine. The power is derived from a strong storage battery.

An electrical device for examining the interior walls of a cannon consists of an incandescent lamp, the invention of a French army officer. It is placed at the end of a brass tube,

blackened on the inside, with a mirror set in it at an angle of 45°, so that it will reflect up through the tube the light of the electric lamp below, which is thrown against the wall of the projectile or cannon which it is desirable to examine.

An improved device for joining electric wires consists of a coupling made of thin sheet brass or copper turned in solder has been contrived for electrical wires. The new device may be applied without the aid of any special tools, and makes a neat appearing joint without materially enlarging the wire at the joint, as is the case in ordinary couplings.

An electrical indicator for steam engines, in which the pencil is made to touch or retire from the drum by the invention of an electro magnet, is a new Chicago device. A number of these magnets may be placed on the same circuit, and by this means the indicators will all be operated at exactly the same instant, by merely closing a single key.

Two young electricians of Olinnati, named Nagel and Halldobler, have invented a sort of telephone, which fixes the spoken word on a chemically prepared sheet of paper.

A Leeds inventor claims the credit of having constructed several electric clocks, which are simply driven by natural electricity from the earth itself. "I find," he says, "by the galvanometer that the earth's currents vary very much, but by an automatic arrangement fixed by the pendulum I can keep time to within one minute in 12 months."

A late telephone invention has a glass diaphragm resting on glass rods and communicating with the ordinary wire. A whispered conversation has been carried on audibly over a distance of three miles.

PROGRESS IN ELECTRIC TRACTION.—In 1885 there were only three electric railways in operation, with 13 cars; in 1886, five with 30 cars; 1887, seven with 51 cars; in 1888, 32 with 265 cars; in 1889, 104 with 965 cars; in 1890, 126 with over 2000 cars, and there are now in operation and under contract in this country, England, Germany, Italy, Australia and Japan, not less than 325 roads, requiring over 4000 cars and 7000 motors, with 2000 miles of track, making a daily mileage of not less than 400,000 miles and carrying three-quarters of a billion of passengers. It is said that one-fourth of the street railways in the United States are now being operated wholly or in part by electricity, two-thirds by horses, a sixteenth by dummy engines and a twentieth by cable. The success attending the use of electricity as motive power is well illustrated by the cars of the West End road in Boston, which are said to make better time than those on the elevated railways in New York City. In 69 cities where electric railways are in operation, but eight human lives have been lost in consequence, and but two of these were due to electricity. Not a single death has thus far been traced to the trolley wire, the two mentioned having been the result of contact with electric light wires. This is a remarkable showing, and brings to mind the frightful predictions made by alarmists when it was first proposed to operate the street railway by electricity. The average cost of operating the different kinds of street railways per car mile is about as follows: Horse, 18.16 cents; cable, 14.12 cts.; electric, 18.12 cts. With these facts in view, and the further fact which must be admitted by every intelligent person, that the science of electric traction is as yet but in its infancy, what may not be expected from it when this new science of energy shall have reached its full growth of maturity?

A NEW POSSIBILITY SUGGESTED.—In considering the future possibilities of the science of electricity in connection particularly with the propulsion of ships, Mr. Oberlin Smith, in a lecture recently delivered before the Franklin Institute, propounded the idea that the ships of the future will probably be driven by electricity, by means of a simple rotating armature fixed directly upon the shaft of the screw itself. The source of the electric current for driving the motors of these prospective three or four day Atlantic liners, Mr. Smith considers would probably be storage batteries placed in the extreme bottom and along the whole length of the hold, where they will serve as excellent ballast, or else the current will be generated by some direct process from coal or other fuel, either burned or otherwise chemically disorganized during the passage. The same current would be available for loading and unloading cargo and for miscellaneous work.

ELECTRIC MACHINERY is being rapidly introduced into war practice, both upon land and upon the sea. There is no doubt but that this new agent will come into large and varied use in the warfare of the future, and that it will form a most important factor in deciding future battles. The search light will present an important feature in preventing surprises. One of these light projectors, with one man on the lookout, would take the place of a whole ship's crew waiting in arms during the long, dreary nights in the vicinity of an enemy. The use of electric lights in commerce is of equal or more importance as has been shown in the navigation of the Suez canal, and as will also be found in our own inter-ocean highway which will soon be navigated at Nicarauga.

SPREADING THE LIGHT.—The tall electric light masts, some eight or ten of which have so long shed their 16,000 candle-power over certain quarters of the city from an elevation

of from 100 to 150 feet, are to come down, and in their stead eight "lesser light," of 2000-candle power are to take their places at an elevation of only 40 feet. It is thought that a multiplicity of lights at a lower elevation will be more effective in revealing the movements of midnight marauders than the more powerful illuminators at their present high points of elevation.

THE BRILLIANCY OF THE ARC LIGHT is said to result from the vaporization of carbon. It is estimated that to produce this over 10,000 degrees Fahr. is required.

ALUMINUM NOTES.

THE ALUMINUM AGE is the title of a periodical which has recently been started at Newport, Kentucky, devoted more especially, as its name indicates, to the spread of information in regard to the manufacture and introduction into practical use of the metal aluminum. It also takes a lively and earnest interest in the progress of all industries and the development of every natural resource which tends to build up and enrich and otherwise benefit the country and the age in which we live. We clip and condense a large portion of the following items from the paper referred to:

THE PRODUCTION OF ALUMINUM in the United States in 1889, including that contained in alloys, was 47,468 pounds, worth \$97,335. Besides, there were imported 999 pounds, valued at \$6688. As indicating a single consumptive requirement for the metal, it is interesting to note that the total of aluminum alloys produced in the United States has increased tremendously in recent years. The figures for such alloys in 1889 were 171,759 pounds. The English production of aluminum is about 12,000 pounds per annum, the French 5000 and the German 9500 kilos—the last mentioned, all by one works. The world's entire production from 1860 to 1889 amounted probably to 110 short tons, exclusive of alloys. All who are interested in this important "coming metal" will be pleased to learn that, with its increasing production, its price is also being rapidly reduced, until it is now nearly or quite down to the figure at which it may be largely introduced into very general and practical use.

THE ALUMINUM STEAM YACHT, which was recently launched upon the waters of Lake Zurich, in Switzerland, is attracting much attention and is justly regarded as a valuable product of Swiss industry—a forerunner of what it is hoped will soon be seen on all rivers and lakes everywhere. Moreover, it is eminently fitting that this first development of the "coming metal" in this direction—this latest improvement in ship-building, made thus useful by the skill of man—should first grace the waters of the Upper Rhine, for it is largely those waters which have developed the electricity which constitutes one of the chief factors in bringing this metal from its fastness in the clays of the earth. The boat carries eight persons, and with a petroleum engine runs at a speed of six miles an hour. The aluminum was produced by the electrical method of Schaffhausen. Inside of the boat everything, so far as possible, is made of this silver white metal. The seats, the gunwales, the hand-rails, the rudder, the tiller ropes, even the engine and all its appurtenances, are thus constructed. The engine weighs 260 pounds, while the whole boat and all its appurtenances weigh only 970 pounds.

ANOTHER CUT IN ALUMINUM.—It is now announced that the Pittsburgh Reduction Company has made another cut in the price of aluminum, and the new metal is now selling at one dollar per pound for any quantity. This move was taken by the company mentioned evidently with a view of developing a large market for aluminum. It is held that at the price now quoted, aluminum, which is nearly four times lighter than nickel or German silver, is a much cheaper metal to use than either. Certain it is that at the price now fixed the number of purposes for which aluminum may be economically used will be largely increased.

A NEW ALUMINUM ALLOY.—It is reported that Professor Roberts-Austen has discovered a new alloy of gold and aluminum, the precious metal being present in the proportion of 78 per cent. It is described as the most brilliantly colored alloy as yet known. Its color is a rich purple, and by the reflection of light from one surface of the alloy to another bright ruby tints are obtained. The facility with which aluminum unites with most metals has long been known, and the fact has been turned to profitable account in many industries, notably in the manufacture of steel, Hercules metal and other aluminum bronzes. Other alloys of the metal with gold have been known also. One per cent of aluminum gives the precious metal the color of green gold.

ALUMINUM ALLOY COMPOSITE.—It is impossible, says *Power and Steam*, to foretell what will be the ultimate effect of this development of aluminum steel. Secretary Tracy is very enthusiastic on the subject, and is naturally gratified at being one of the pioneers in taking up the new alloy, which was first used as a material for armor plates, but now promises to enter into the construction of not only armor plates, guns and projectiles, but the hulls and engines of ships, and, if the cost of aluminum alloy

composite can be reduced, it is believed it will be adopted for all purposes where a high grade of steel is at present used. Aluminum alloy composite is perhaps the best known and most useful alloy that possesses very marked distinctive properties by fusing together with iron, steel, copper, brasses, etc. Different proportions of the alloy are used to meet the requirements of various uses for which the castings are intended to be used. The peculiar qualities of the constituent metals exercise considerable influence on the results.

THE NEWPORT ALUMINUM WORKS has increased its capacity to more than double its former output and reduced the metal to nearly one-half its former price.

AN ALUMINUM MOTOR.—J. W. Hanson, a jeweler in St. Paul, Minn., is having an electric motor made out of aluminum. It will be the first motor ever made of this new metal. It is obtained from an entirely new design, occupies a small space and is very light, yet accomplishes as much as an ordinary motor. Thus an ordinary motor may weigh 100 pounds or more, yet this weighing only 20 or 30, being a quarter less than the ordinary, possesses great advantage in lightness. A boy can walk off with it.

TO SOLDER ALUMINUM.—The line of juncture is prepared by applying a mixture of resin, talow and neutral chloride of zinc. Scraping and cleaning the joints is to be avoided, although alcohol or turpentine may be used when cleaning is absolutely necessary. By applying the hot soldering iron the neutral chloride of zinc is at once converted into metallic. The rapid action thus created forms the strong affinity for aluminum.

GOOD HEALTH.

Health of the State.

The report of the State Board of Health for August furnishes returns from 66 cities and towns, with an aggregated population of 760,054. Total number of deaths, 975, or a rate of 16.56 per cent for the year.

Consumption caused 22 deaths; pneumonia, 52; bronchitis, 19; congestion of lungs, 15; diarrhoea and dysentery, 19; cholera infantum, 48; other diseases of the bowels and stomach, 59. Cancer claimed its 30 victims and heart disease 85. The rapid proportionate increase of the two latter is especially worthy of note. San Francisco has established

A Good Record for Death.

And has shown itself one of the healthiest cities on the globe, notwithstanding the fact that more than any other city, it is made a hospital for the sick from every part of the State. The last annual report of the Health Officer of the city, Dr. J. W. Keeney, gives the total number of deaths for the year as 6650, of which number 6114 were whites, 512 Chinese and 24 colored. Basing the calculation on a population of 312,000 whites and 18,000 Chinese, the percentage of deaths is 21.15; Chinese, 33.15; in public institutions, 33.30. The number of deaths was 272 in excess of the previous year, and still the percentage is among the lowest of the nation's large cities. The high rate among the Chinese is because they have no care and live in total disregard of sanitary laws. If the rate of Chinese mortality and all public institutions were omitted from the grand estimate, it would show San Francisco about the healthiest city on the globe.

Three deaths from small-pox cover the year's record, and at present there is very little diphtheria. The market inspectors have wrought a wonderful improvement in the meat traffic.

The Health Officer requests that the Board of Supervisors should be more careful and not allow protests "when I recommend a sewer in a street as a sanitary measure; it is impossible for me to keep the city in a sanitary condition unless I have your help and protection."

This request is an eminently proper one. Much fault is found with the contractors who have undertaken to keep the city rid of dead animals. They are very slack in the discharge of their duties and the doctor suggests that the city be more careful in future about awarding such contracts.

Owing to the many complaints against chickens and other fowls, it is suggested that an ordinance be passed describing a limit within which it shall not be lawful to keep them.

BRAIN AND CLIMATE.—The average weight of the brain of man bears a definite relation to the climate in which he lives, a heavier brain weight being found in cold than in warm countries. In proportion to their stature the Lapps have the largest heads in Europe, the Norwegians next, then come the Swedes, Germans, French and Italians. In the Arab the head is found to be smaller than any of the above, while in the far north there exists a people called Chngatahes, whose heads are remarkably large.

TAKING COLD.—A Leipzig scientist has demonstrated by facts and figures what most people have always believed that colds are often caught by those who wrap themselves up and avoid the severity of the weather than by those who dare to brave the elements.

MONKEY AND MEN.—A Lyons anatomist has examined the skeletons of 86 monkeys—chimpanzees, gorillas and orang-outangs—and has found diseases of the bone to be as frequent as in man, and of a strikingly similar character.



A. T. DEWEY.

W. B. EWER.

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Saturday, September 26, 1891.

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[NEW THIS ISSUE.]

Band and Hoop Coupling—Fulda Bros.
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Passing Events.

The laying of the corner stone, at Sunnyside, of the power-house for the San Mateo electric railroad line, marks quite an epoch in railroad matters on this coast. An electric road is practically to parallel a steam road and compete for passenger traffic over quite a distance. The experiment will be watched with interest here and elsewhere.

A very novel project is being considered in this city in the direction of milling ores. It is proposed to put the mills underground so as to save hoisting and surface transportation of Comstock ores. The novelty of the proposition will provoke discussion even if nothing more comes of it.

Several strikes have been made on old mines in the old districts of Julian and Banner, San Diego county. These mines were opened in 1869-70, and were quite prosperous for a few years. Then for many years a number of the mines were abandoned. Not long since work was resumed and now several of them show remarkably well as depth is attained. History repeats itself in these as in many other of the gold camps of California.

Why the Bullion Product of California Has Suffered Decline.

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But going still further than the above, we find that in a published work issued, in 1887, by Theodore Suto, attorney, counsellor, etc., for the then Suto Tunnel Co., an article taken from the *National Quarterly Review* for July, 1879, and republished in the *New York Daily Graphic* of July 21, 1879, in which, after referring to its many advantages, says:

"The chief among these additional advantages, is the facility which the tunnel will afford for extracting and smelting the millions of tons of low-grade ore, which lies partly exposed to view in its many miles of shafts and galleries, and partly still concealed in the depths of the Comstock mines, having heretofore been passed by as not likely to pay for the expense of hoisting it to the surface and of transporting it to the mills and reduction works. The tunnel will afford the cheapest possible way of utilizing these immense ore bodies through the instrumentality of chutes, by which the ore can be lowered into cars and conveyed through the mouth of the tunnel to the mills near the Carson river. * * * The correctness of this view is demonstrable. If we consider that this ore assays from \$10 to \$20 per ton, and that the expense per ton from the time of extracting it until it is in the shape of bullion, under the old system, is at least \$20, while through the tunnel and mills at the Carson river, it is estimated that it will not exceed \$8."

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Native Alloy of Nickel and Iron.

Prof. G. H. Ulrich last year read a paper before the London Geological Society "On the Discovery, Mode of Occurrence and Distribution of the Nickel-Iron Alloy, 'Awaruite,' on the West Coast of the South Island of New Zealand." His conclusions are important in view of discoveries on the California coast, as will appear further on.

The discovery was made in a collection of minerals sent to the Government laboratory by Mr. Macfarlane. Mr. Skey, the Government analyst, who found the new alloy in small grains or scales in a sample of black sand reported and supposed to have been saved by alluvial miners in Gorge river. Its quantitative chemical composition as = Ni=67.63; Co.=0.70; Fe=31.02; S=0.22; SiO₂=0.43; Formula = 2 Ni + Fe; Sp. Gr.=8.1. Hardness about 5, strongly magnetic. Among other minerals in the black sand was a hydrous ferruginous serpentine, which proves to be the matrix of the alloy. The rock is described as being a dark green serpentine, and the alloy was traced and found in it in small metallic specks.

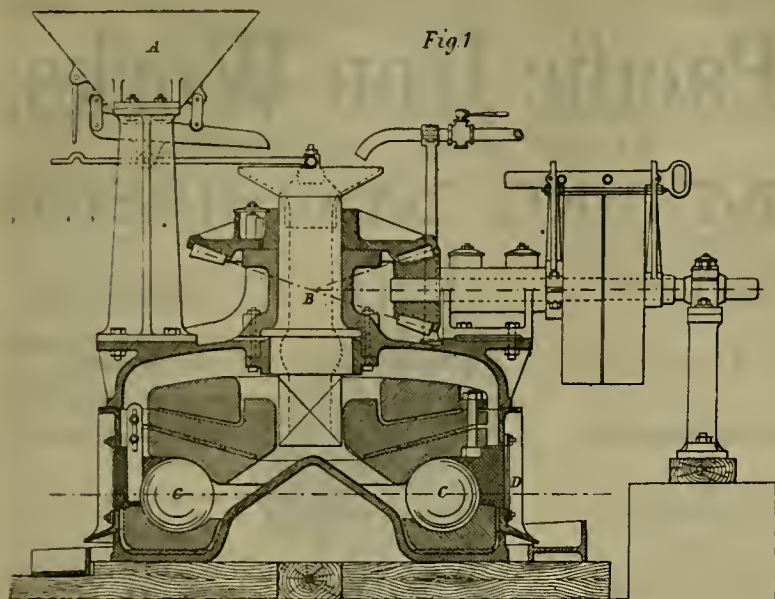
The first sample of Awaruite bearing black sand examined by Mr. Skey, was supposed to have come from Barn hay, but it was subsequently proved to have been washed from the drift of the Gorge river. The valley of this river has since generally been considered the only place of occurrence of this mineral. Mr. G. Mueller, the Chief Surveyor, says the mineral is found in the bed and banks of the river.

As in consideration of the large extent of the peridotite, or serpentine rocks, it seemed to Prof. Ulrich very unlikely that the occurrence of the mineral should be confined to the Gorge river only, he specially requested Mr. R. Paulin, before he set out on his exploring and prospecting trip, to look out for the alloy in the Olivine and serpentine rocks and the drift of the rivers and creeks. This gentleman found small specks in the rocks of various localities, the most conspicuous at Silver creek, and thought it occurred throughout the whole formation. The free nickel found in the different river-beds, was much coarser than any he had seen in the stone. The area of distribution of the Awaruite was then proved to be far more extensive than at first imagined, and Prof. Ulrich sees nothing unreasonable in his belief that the mineral occurs in the impregnated matrix throughout the whole extent of the peridotite and serpentine rocks and inferentially in the liberated state in the drifts derived therefrom.

The gradual gathering of practical proof of this, however, may take a long time, owing to the great hardships and dangers connected with prospecting in the wild, inhospitable district referred to. The supposed recognition of awaruite distributed through the rock will also, in many cases, not be free from doubt, owing to the smallness of the specks and their frequent association with, and general resemblance in color to, grains of pyrite, which may therefore be easily mistaken for it. The simplest test in the case of detached specks is by application of the magnet, which energetically attracts the awaruite specks, but leaves those of pyrite unaffected. The malleability of the specks affords another proof of their identity.

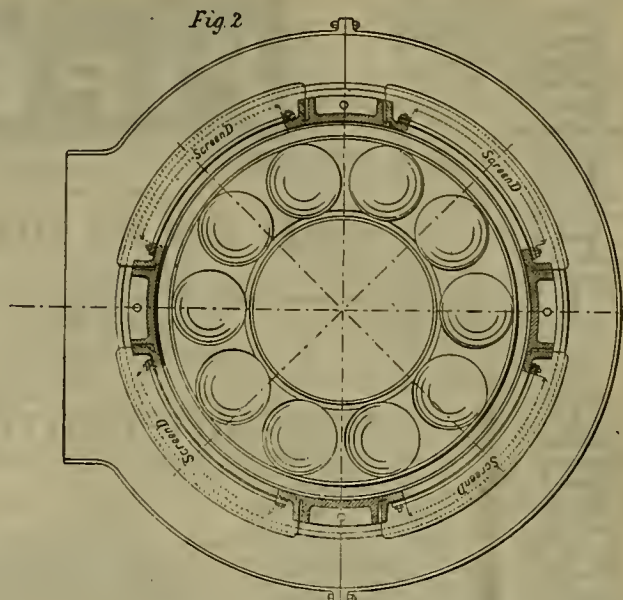
The native alloy of platinum and iridosmine, which occurs with the gold in the black sands on the sea beach at Port Oxford and at other parts of this coast, very much resembles the awaruite, and although the platinum alloy only contains about four per cent of iron, yet strangely enough it is strongly magnetic.

The platinum alloy has not as yet been discovered in place, so that the serpentine rocks near Smith's river and at other points on this coast should be carefully examined. The specks or scales are so small that they may easily be taken for grains of pyrite, as stated, so that care must be exercised.



THE LAMBERTON ORE-CRUSHING MILL.

(See opposite page.)



PLAN OF LAMBERTON MILL.

Gas Cut-off for Blast Furnace.

In continuing the extracts from D. Wedding's paper on the "Progress of German Practice in Metallurgy," which we have been making of late, cuts are given, showing the gas cut-off for blast furnaces, and the arrangement of checkerwork for hot-blast stoves.

Brick hot-blast stoves are so nearly universal that iron stoves can be found at few works. The former have proved economical wherever the blast is to have at least 600° C. of temperature. With well-built iron-pipe stoves, 500° to 550° C. can be maintained without difficulty, as is proved at Gleiwitz. The opposition to brick stoves lasted longest in Upper Silesia, where the immense quantity of zinc dust (oxide) carried by the tunnel head gas rendered the economy and even the operation of such stoves problematical. When they were finally adopted, their employment required a careful pre-cleaning of the gas, which was performed first in the dry way, afterward by means of water spray. And it is still necessary in cases (frequent in Upper Silesia) where the ores carry zinc, to blow out the stoves by letting the blast pass through them for a brief period (often not more than a second) before admitting it to the blast furnace.

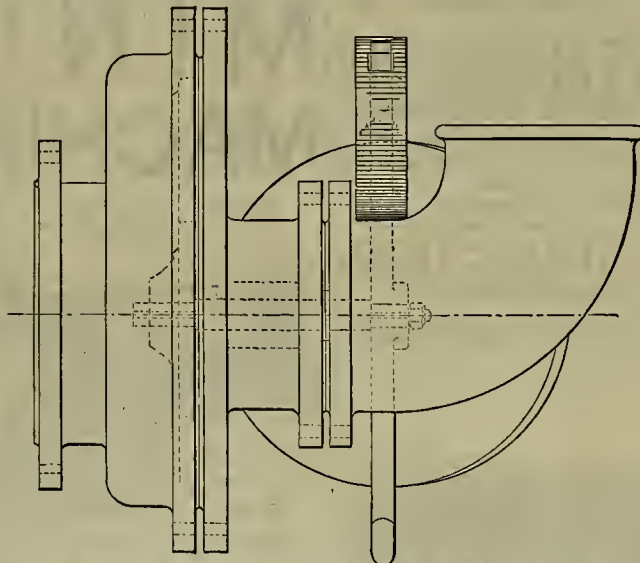
Iron stoves have been, and will be with good reason, retained where a low-alloy gray or mottled iron is made, especially for chill-castings, to which end, it is true, a cold blast is not, according to the ancient prejudice, necessary, but the blast should not be better than

300° C. It is certainly an error to employ brick stoves for low temperatures. They give their best results at a blast temperature of 900° C. In form these stoves have followed the well-known line of development, from the original checkerwork to vertical cylindrical or prismatic flues.

For a long time, difficulty was encountered

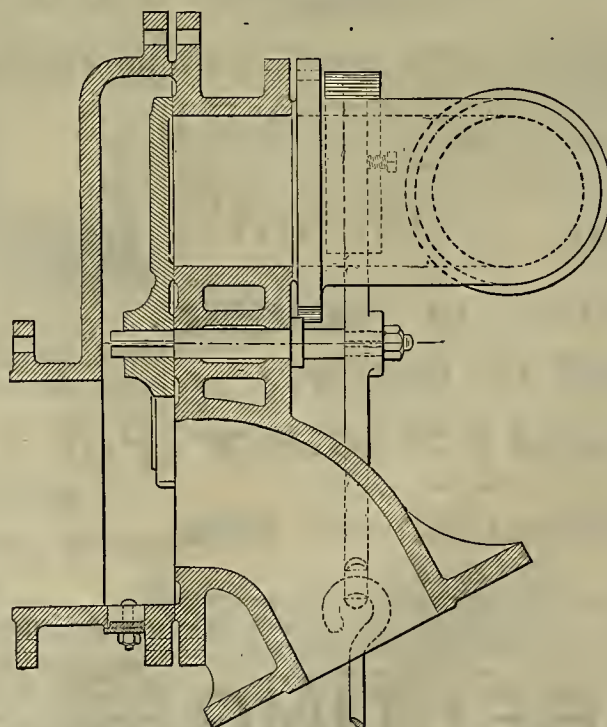
in so conducting the burned gases as to heat uniformly the entire cross-area of the apparatus; and engineer Becker, at Friedenshütte, near Morgenroth, in Upper Silesia, effected an important improvement when, instead of giving a uniform cross-area to his gas-flues, he made those in the center, where the gases traverse the shortest path, smaller than those

FIG. 3.



SIDE VIEW OF GAS CUT-OFF FOR BLAST-FURNACE.

FIG. 4.



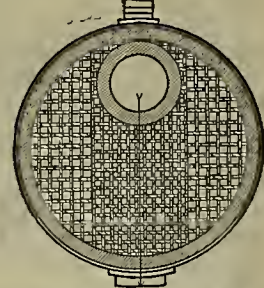
SECTION OF GAS CUT-OFF FOR BLAST-FURNACE.

at the sides, through which the path is longer. Fig. 1 shows his construction. The same end has been sought of late in Luxemburg by means of slide-valves, apparently a less simple and effective device.

To prevent the gas from striking back into the blast pipe, the simple Steffen "spectacles" (Brillen), shown in Figs. 2-5, are largely employed.

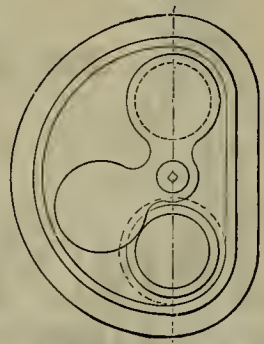
The blast-furnace gases are, of course, primarily used for heating the blast, but secondarily, also, in raising steam, particularly for the blowing-engines. A disaster at Friedenshütte in Upper Silesia, which spread consternation through the whole district, namely, the simultaneous explosion of a set of 22 boilers, heated with blast-furnace gas, gave rise to a thorough re-examination of the subject of firing under boilers with gas. While it was proved that even a serious gas-explosion under such circumstances could not possibly produce of itself such frightful effects as this instance presented, still it was not disproved that the impulse to the beginning of a steam-explosion might possibly be occasioned by the accumulation and subsequent explosion of unburned gas in the flues beneath and between the boilers. All the witnesses of the Friedenshütte catastrophe became its victims, and a complete explanation of it can never be given. But in rebuilding the boiler-department of the works, great care was exercised to secure, by means of regenerators in front of the gas-jets, the spontaneous and certain ignition of the gas-current whenever, after any brief intermission, it may be again directed under the boilers.

FIG. 1.

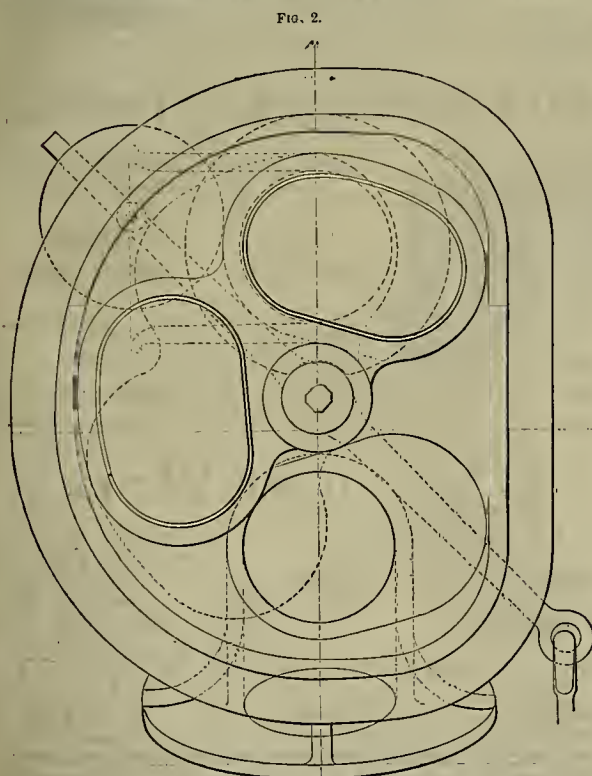


ARRANGEMENT OF CHECKERWORK FOR HOT-BLAST STOVES.

FIG. 5.



SPECTACLES IN GAS CUT-OFF FOR BLAST-FURNACE.



FRONT VIEW OF GAS CUT-OFF FOR BLAST-FURNACE.



A. T. DEWEY.

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SAN FRANCISCO:

Saturday, September 26, 1891.

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[NEW THIS ISSUE.]

Band and Hoop Coupling—Fulda Bros.
Belting—French & Linforth.

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Passing Events.

The laying of the corner stone, at Sannyside, of the power-house for the San Mateo electric railroad line, marks quite an epoch in railroad matters on this coast. An electric road is practically to parallel a steam road and compete for passenger traffic over quite a distance. The experiment will be watched with interest here and elsewhere.

A very novel project is being considered in this city in the direction of milling ore. It is proposed to put the mills underground so as to save hoisting and surface transportation of Comstock ores. The novelty of the proposition will provoke discussion even if nothing more comes of it.

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The discovery was made in a collection of minerals sent to the Government laboratory by Mr. Macfarlane. Mr. Skey, the Government analyst, who found the new alloy in small grains or scales in a sample of black sand reported and supposed to have been saved by alluvial miners in Gorge river. Its quantitative chemical composition as = Ni=67.63; Co.=0.70; Fe=31.02; S=0.22; SiO₂=0.43; Formula = 2 Ni+Fe; Sp. Gr.=8.1. Hardness about 5, strongly magnetic. Among other minerals in the black sand was a hydrous ferruginous serpentine, which proves to be the matrix of the alloy. The rock is described as being a dark green serpentine, and the alloy was traced and found in it in small metallic specks.

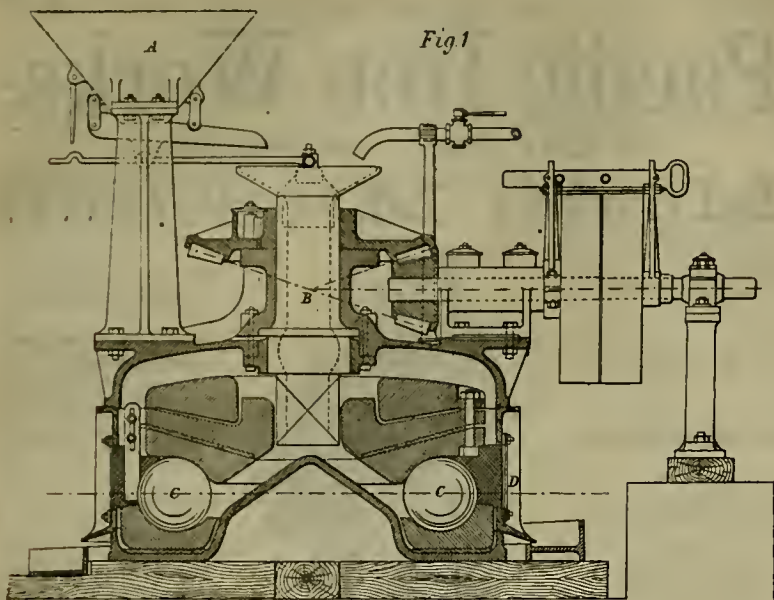
The first sample of Awaruite bearing black sand examined by Mr. Skey, was supposed to have come from Barn hay, but it was subsequently proved to have been washed from the drift of the Gorge river. The valley of this river has since generally been considered the only place of occurrence of this mineral. Mr. G. Maeller, the Chief Surveyor, says the mineral is found in the bed and banks of the river.

As in consideration of the large extent of the peridotite, or serpentine rocks, it seemed to Prof. Ulrich very unlikely that the occurrence of the mineral should be confined to the Gorge river only, he specially requested Mr. R. Paulin, before he set out on his exploring and prospecting trip, to look out for the alloy in the Olivine and serpentine rocks and the drift of the rivers and creeks. This gentleman found small specks in the rocks of various localities, the most conspicuous at Silver creek, and thought it occurred throughout the whole formation. The free nickel found in the different river-beds, was much coarser than any he had seen in the stone. The area of distribution of the Awaruite was then proved to be far more extensive than at first imagined, and Prof. Ulrich sees nothing unreasonable in his belief that the mineral occurs in the impregnated matrix throughout the whole extent of the peridotite and serpentine rocks and inferentially in the liberated state in the drifts derived therefrom.

The gradual gathering of practical proof of this, however, may take a long time, owing to the great hardships and dangers connected with prospecting in the wild, inhospitable district referred to. The supposed recognition of awaruite distributed through the rock will also, in many cases, not be free from doubt, owing to the smallness of the specks and their frequent association with, and general resemblance in color to, grains of pyrites, which may therefore be easily mistaken for it. The simplest test in the case of detached specks is by application of the magnet, which energetically attracts the awaruite specks, but leaves those of pyrite unaffected. The malleability of the specks affords another proof of their identity.

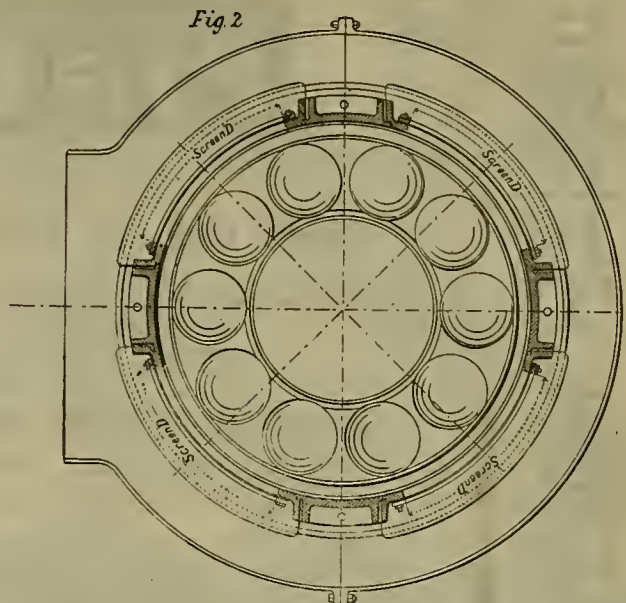
The native alloy of platinum and iridosmine, which occurs with the gold in the black sands on the sea beach at Port Oxford and at other parts of this coast, very much resembles the awaruite, and although the platinum alloy only contains about four per cent of iron, yet strangely enough it is strongly magnetic.

The platinum alloy has not as yet been discovered in place, so that the serpentine rocks near Smith's river and at other points on this coast should be carefully examined. The specks or scales are so small that they may easily be taken for grains of pyrite, as stated, so that care must be exercised.



THE LAMBERTON ORE-CRUSHING MILL.

(See opposite page.)



PLAN OF LAMBERTON MILL.

Gas Cut-off for Blast Furnace.

In continuing the extracts from D. Wedding's paper on the "Progress of German Practice in Metallurgy," which we have been making of late, cuts are given, showing the gas cut-off for blast furnaces, and the arrangement of checkerwork for hot-blast stoves.

Brick hot-blast stoves are so nearly universal that iron stoves can be found at few works. The former have proved economical wherever the blast is to have at least 600° C. of temperature. With well-built iron-pipe stoves, 500° to 550° C. can be maintained without difficulty, as is proved at Gleiwitz. The opposition to brick stoves lasted longest in Upper Silesia, where the immense quantity of zinc dust (oxide) carried by the tunnel blast gas rendered the economy and even the operation of such stoves problematical. When they were finally adopted, their employment required a careful preheating of the gas, which was performed first in the dry way, afterward by means of water spray. And it is still necessary in cases (frequent in Upper Silesia) where the ores carry zinc, to blow out the stoves by letting the blast pass through them for a brief period (often not more than a second) before admitting it to the blast furnace.

Iron stoves have been, and will be with good reason, retained where a low-silicon gray or mottled iron is made, especially for chill-castings, to which end, it is true, a cold blast is not, according to the ancient prejudice, necessary, but the blast should not be hotter than

300° C. It is certainly an error to employ brick stoves for low temperatures. They give their best results at a blast temperature of 900° C. In form these stoves have followed the well-known line of development, from the original checkerwork to vertical cylindrical or prismatic flues.

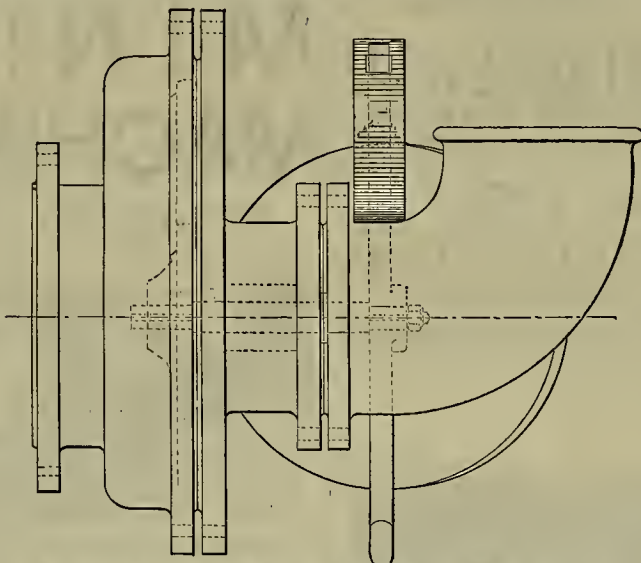
For a long time, difficulty was encountered

in so conducting the burned gases as to heat uniformly the entire cross-area of the apparatus; and engineer Bocker, at Friedenshütte, near Morgenthau, in Upper Silesia, effected an important improvement when, instead of giving a uniform cross-area to his gas-flues, he made those in the center, where the gases traverse the shortest path, smaller than those

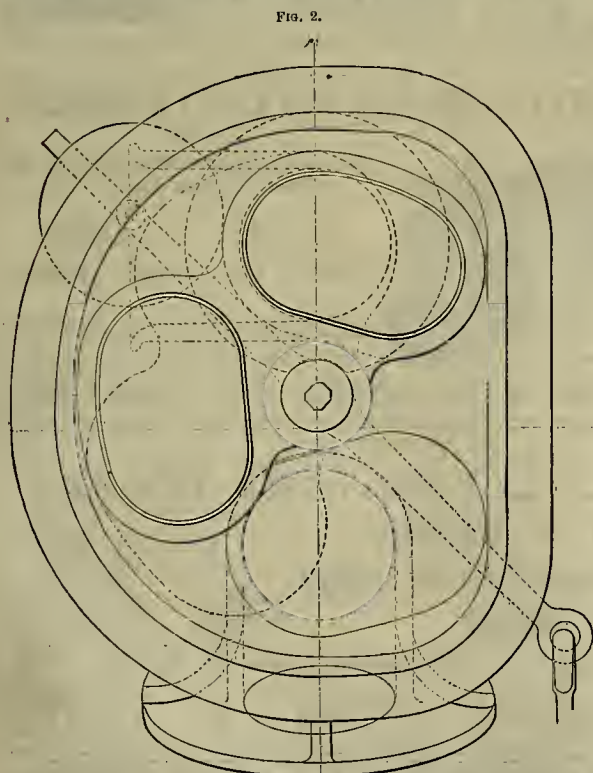
at the sides, through which the path is longer. Fig. 1 shows his construction. The same end has been sought of late in Luxemburg by means of slide-valves, apparently a less simple and effective device.

To prevent the gas from striking back into the blast pipe, the simple Steffen "spectacles" (Brillen), shown in Figs. 2-5, are largely employed.

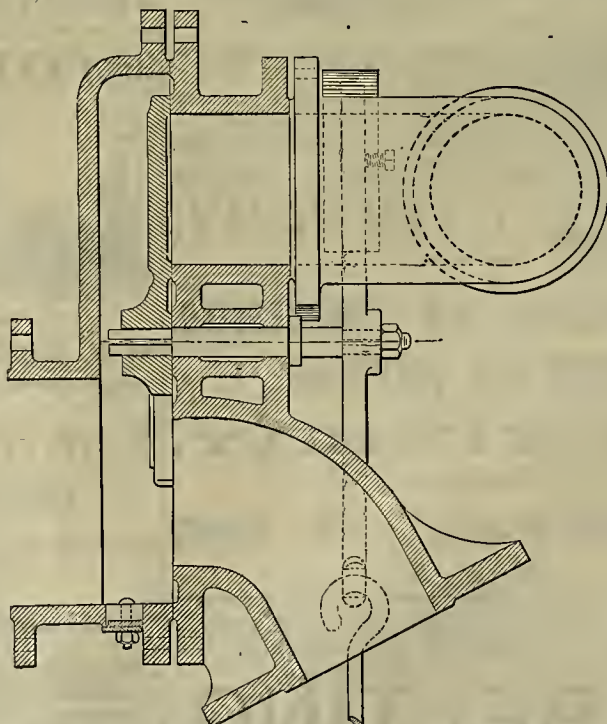
The blast-furnace gases are, of course, primarily used for heating the blast, but secondarily, also, in raising steam, particularly for the blowing-engines. A disaster at Friedenshütte in Upper Silesia, which spread consternation through the whole district, namely, the simultaneous explosion of a set of 22 boilers, heated with blast-furnace gas, gave rise to a thorough re-examination of the subject of firing under boilers with gas. While it was proved that even a serious gas-explosion under such circumstances could not possibly produce of itself such frightful effects as this instance presented, still it was not disproved that the impulse to the beginning of a steam-explosion might possibly be occasioned by the accumulation and subsequent explosion of unburned gas in the flues beneath and between the boilers. All the witnesses of the Friedenshütte catastrophe became its victims, and a complete explanation of it can never be given. But in rebuilding the boiler-department of the works, great care was exercised to secure, by means of regenerators in front of the gas-jets, the spontaneous and certain ignition of the gas-current whenever, after any brief intermission, it may be again directed under the boilers.



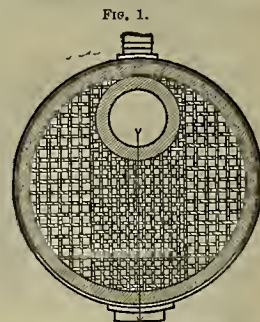
SIDE VIEW OF GAS CUT-OFF FOR BLAST-FURNACE.



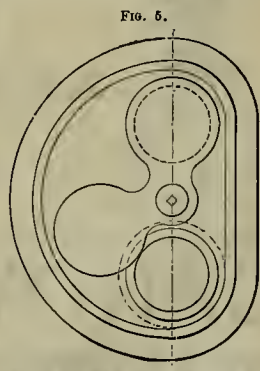
FRONT VIEW OF GAS CUT-OFF FOR BLAST-FURNACE.



SECTION OF GAS CUT-OFF FOR BLAST-FURNACE.



ARRANGEMENT OF CHECKERWORK FOR HOT-BLAST STOVES.



SPECTACLES IN GAS CUT-OFF FOR BLAST-FURNACE.

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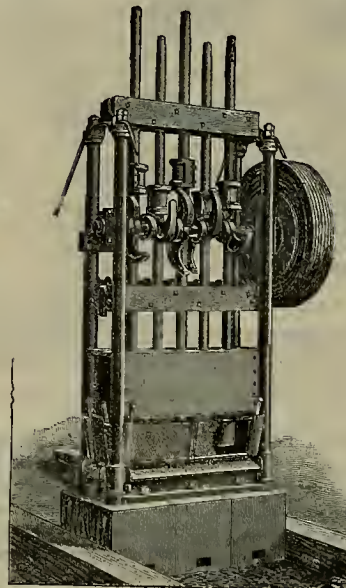
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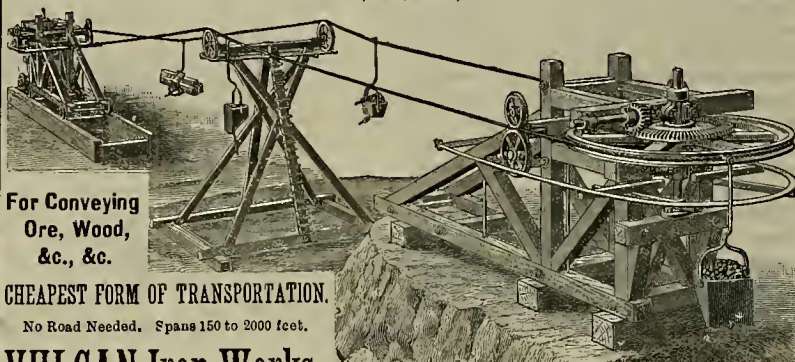
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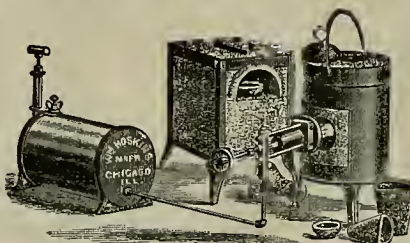
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING SEPT. 15, 1891.

- 459,541.—HALTER.—Robt. Bruce, Pendleton, Or.
 459,674.—IMPALEMENT TRAP.—W. Cameron, Milpitas, Cal.
 459,675.—CLAMP FOR PLANERS, ETC.—Chalmers & Wallace, S. F.
 459,684.—ORE CONCENTRATOR.—A. Fraser, S. F.
 459,631.—MAIL BAG.—Jos. Hanauer, Spokane Falls, Wash.
 459,466.—FEED MILL.—Henry & Wood, Portland, Or.
 459,467.—FRUIT-GATHERER.—Joseph Herring, Pomona, Cal.
 459,731.—WAGON TONGUE SUPPORT.—T. H. Ink, St. Helena, Cal.
 459,638.—DEVICE FOR TAPPING MAINS.—M. P. Madden, Coronado Beach, Cal.
 459,524.—GANG PLOW.—F. M. Mecum, Chico, Cal.
 459,525.—REVERSING VALVE GEAR.—J. C. Nicholson, S. F.
 459,649.—DITCHING MACHINE.—E. M. Reese, Santa Paula, Cal.
 459,527.—ROTATING AIR COMPRESSOR AND PUMP.—H. R. Chmunn, Santa Cruz, Cal.
 459,653.—CHURN.—J. Simpson, Waitsburg, Wash.
 459,657.—ORE CRUSHER.—A. H. Schierholz, S. F.
 459,462.—OILER.—J. T. Smith, S. F.
 459,529.—PUMP.—A. W. White, San Jose, Cal.
 21,042.—DESIGN FOR RAILWAY CAR BODY.—J. Hammond, S. F.
 21,048.—DESIGN FOR EASEL.—F. Y. X. Miller, Olympia, Wash.

The following brief list, by telegraph, for Sept. 22, will appear more complete upon receipt of mail advices: California—Theodore M. Connor, Los Angeles, notified wire fab le machine; Harry G. Cox, Alvarado, harness; Beau Hooker, San Diego, compound for preserving ship's bottoms, etc.; Frank E. Smith, San Jose, outfit for electric program clock; Henry Thibault and C. D. Harlin, Stockton, engine; W. M. Betts, S. F., auxiliary safety spring.

Oregon—Samuel Froedenrich and T. J. Gelsler, Portland, piano attachment.
 Notes.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press U. S. and Foreign Patent Agency, the following are worthy of special mention:

GANG PLOW.—Francis M. Mecum, Chico, Butte Co. No. 459,524. Dated Sept. 15, 1891. This invention relates to devices by which the plows of a gang may be more easily and accurately adjusted with relation to their work and it consists of a novel mechanism by which the plows and frame may be raised or depressed with reference to the land wheel, a means for preventing the plows from running too far into the land by setting the furrow wheel at an angle when the plows are at work, so that it acts as a brace against the side of the furrow, said wheel being easily adjusted to run in a vertical plane parallel with the opposite wheel whenever desired. The pole is also adjustable with reference to the frame so that the plows may be inclined to run into or out of the ground at pleasure.

REVERSING VALVE-GEAR FOR ENGINES.—James C. Nicholson, S. F. No. 459,525. Dated Sept. 15, 1891. This invention relates to a peculiar arrangement of engine valve gear. It consists essentially of a ring or disk mounted upon the crank shaft in a plane oblique to the plane of rotation of the shaft, and this ring is connected with the engine valves, so that its oscillations are communicated to the valves at the proper intervals to admit steam to the cylinder and cut it off. By suitable mechanism, the movements of the valves are changed to reverse the engine, and the supply of steam is cut off at any desired point in the stroke to suit the work. The device serves in place of a link motion with fewer parts and greater simplicity, and is applicable to any engines which must be reversible and which use a variable cut off.

CLAMP FOR PLANERS OR OTHER MACHINES.—Alexander N. Chambers and John P. Wallace, S. F. No. 459,530. Dated Sept. 15, 1891. This is an improved adjustable clamp for use upon planers, drilling, shaping and other machines. The base or shank of the clamp has flanges extending horizontally on either side, these flanges being of sufficient thickness to enter the grooves or slots in the bed-plate, while the body or shank extends up through the narrower portion of the slot to the face of the table, and to the bottom of the clamp, of which it forms an extension. Vertical set-screws pass through outwardly extending lugs, and these screws may be turned down so as to press upon the table or bed-plate after the foot of the clamp has been inserted in its channel and moved to the desired place. These set-screws serve to hold the clamp firmly in place, and any article which is to be secured to the table to be planed, drilled or otherwise worked is held in place by means of horizontal screws passing through one of the vertical ends of the yoke or clamp. Any number of these clamps may be inserted in the various slots in the table so as to be applied to different parts of large pieces.

ROTARY AIR-COMPRESSOR AND PUMP.—Henry Richmann, Santa Cruz. No. 459,627. Dated Sept. 15, 1891. This improvement in rotary pumps or engines consists of an exterior case having the interior periphery formed in two intersecting arcs, a hub rotating about a shaft which forms the center of one of the arcs, so that the periphery of the hub rotates in close proximity or contact with said arc, a spindle projecting through the opposite head of the casing and in the center of the other arc, and

radially sliding pistons fitted to the hub, with packing disks in their outer ends which form contact with the periphery of one of the two intersecting arcs, which form the interior of the case. This mechanism may be used as a suction or force pump either for fluids or liquids, and it may also be used as an engine by introducing any suitable medium under pressure without materially altering the construction described.

A Mine Superintendent Murdered.

An Attempt to Steal the Derbec Bullion.

Associated Press dispatches from Nevada City dated Sept. 17th give the following information: S. Galavotti, superintendent of the Derbec drift mine, was murdered by highwaymen this morning while coming to this city with a \$5000 gold bar just cleaned up at the mine. Galavotti and J. D. Ostrom of North Bloomfield were in a two-horse buggy ascending the South Yuba river grade, 6½ miles from this city, when a rifle shot was fired from the bank above. The hall entered the back of Galavotti's head and emerged from the mouth, causing instant death.

Ostrom, who was driving, struck the horses with a whip, urging them into a run up the steep grade, just as a second shot was fired, the bullet from which entered the neck of one of the horses, but did not bring it down. A turn in the road soon took the team out of the range of the shooters. Ostrom continued to force the team up grade, holding his companion's dead body in the vehicle with one arm and being soaked from head to foot with his life blood.

Reaching the Mount Vernon House, at the head of the grade, Ostrom left Galavotti's body and hid the bullion in the brush. Then taking the uninjured horse, he rode it to this city at the utmost speed to notify the officers of the crime. He did not get a view of the robbers or hear them speak. A wagon was immediately sent out after the dead superintendent's body, accompanied by several squads of armed men.

Ostrom says he thought Galavotti's own gun had been discharged accidentally, so close was the shot fired, till the lifeless body fell backward. Ostrom grabbed it just in time to save it from going out of the buggy. He then struck the horses to get out of danger. They sprang forward just as the second shot, which struck one of the animals in the neck, was fired.

Galavotti's rifle and hat fell to the ground, but the team ran up hill like mad, the blood from the wounded horse deluging the other horse at every jump. Ostrom neither saw nor heard a word from the robbers, of which it is generally believed there were two, although Ostrom thinks there was but one.

The gold bar was brought in with the body. It contains little less than \$4000, being the semi-monthly clean-up. Galavotti, who was one of the best gravel miners in the State, leaves a widow, but no children. Scores of men are searching Yuba canyon and the outlying country in all directions, but as the territory is rugged and heavily timbered and out up with innumerable ravines there is but little chance of capturing the criminals.

The Coroner's jury this evening determined that Superintendent Galavotti came to his death from a gunshot wound received at the hands of an unknown person. The body will be taken to San Francisco to-morrow for burial. His widow, who has just arrived here with Dr. McKilloan, will with him accompany the remains. She bears up bravely under the awful ordeal. The news was broken to her at the mine this morning by Mr. McKilloan. When he told her that her husband had been badly hurt she exclaimed piteously: "Oh, tell me everything, I know my darling husband is dead, for he would never surrender to the cowards."

Galavotti formerly farmed in Monterey county. For four years he kept books at several mines in the State of Nevada. Subsequently he was similarly employed by wholesale firms in Sacramento and San Francisco. He had been superintendent of the Derbec for the last seven years.

Searchers returning from the scene of the robbery report finding one man's track leading from a clump of brush on the hill where the shots were fired. A forty-five-caliber cartridge shell was also found there. One party that took the trail claims to have followed it to Bloomfield, and thinks he has the culprit spotted.

Most of the circumstantial now go to show that there was but one highwayman. The squad that went to North Bloomfield cannot possibly get back here for several hours at least, and the result of their investigations will not be known until they return.

The Derbec Company has offered \$1000 reward for the apprehension of the criminal, in addition to the State's standing reward of \$300 for each highwayman. Governor Markham has also been requested to offer a large special reward on behalf of the State.

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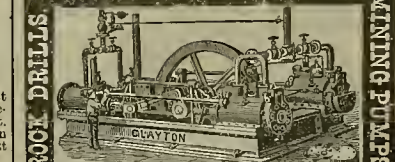
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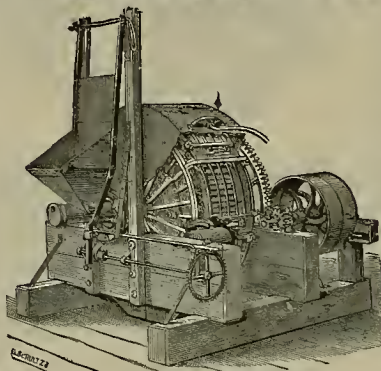
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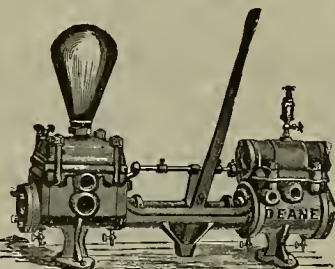
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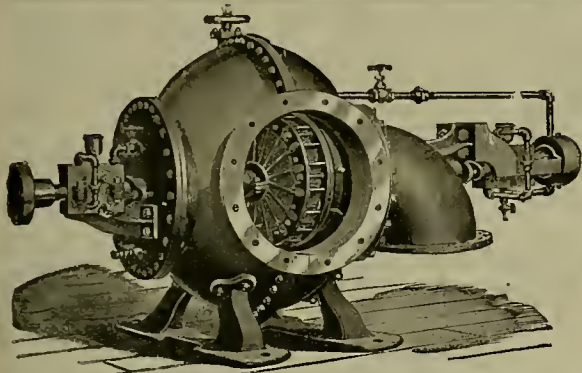
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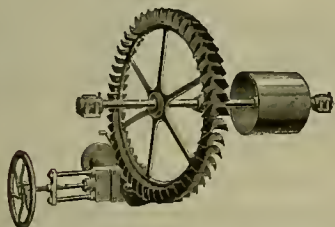


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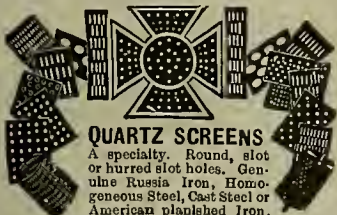
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 24, 1891.

There are no new features to report in the general market. Iron workers continue to report orders ahead—cheap coal and cheap iron are in their favor. The money market is fairly easy with no marked demand from any particular quarter. The commercial and also savings banks, as a rule, report that soon after tax-collecting day they will have more available funds than they can use.

MEXICAN DOLLARS—The market is steady at around 77½ cents. There is a growing belief that better prices will prevail soon.

QUICKSILVER—Receipts the past week aggregate 247 flasks. The market is fairly firm at around \$47. European advices are said to report a very firm market under more favorable statistical advices.

SILVER—The market has been gradually strengthening, with to-day (Thursday) New York coming through at 97½ cts., while for certificates 98½ cts. is quoted. It now looks as if silver in the European markets has been cornered, and with the Indian demand now being in order, prices are liable to do very considerably better from now on. In our market holders are not offering, believing that when the Miot begins purchasing for October, higher prices will obtain. The surplus stock held in this city is not very large, about all received having been sold as soon as it came to hand.

BORAX—Receipts the past week aggregate 320 casks. The market is firm, with a good shipping demand eastward. The ship Com. Allen took out the past week for New York 2048 cts., and the steamer San Blas 1507 cts.

LIME—Receipts the past week, 3552 bbls. The market is fairly steady.

Lead—The local market is fairly steady. By the steamer San Blas, 657 cts. went forward to New York. The New York market is reported very strong, with actual sales reported at an advance over public or exchange quotations.

IRON—Imports the past week aggregate as follows: From Crescent City, 15 tons; Sunderland, 100 tons; total, 259 tons. The market is essentially unchanged. To place a large-sized consignment concessions are asked.

TIN—The market is reported strong for plate, although dull and only fairly steady for pig. Iron Age reports the New York market as follows for pig: "Importations have been heavy, and London has sent mean consolation in the shape of slightly lower range of value there. Local holders of the bulk of spot stock seem still to successfully resist the pressure of rather adverse conditions."

COPPER—There was shipped by sea the past week to New York \$345 cts. matte and 168 cts. cement. New York mail advices report that market as follows: The home consumption has improved somewhat under the influence of recent sharp cuts in prices for several lines of manufactured goods, and export movement on old contracts is still on a liberal scale, but production is doubtless more than sufficient to meet current demands, and prices merely hold their own. Lake Superior ingot has been sold to the extent of several hundred thousand pounds at 12½¢ cash for prompt delivery, and that price apparently represents inside value at this writing. Future deliveries are held firmly at 12½¢. Bids of ¼¢ less were refused. In Arizona there is hardly enough doing to fairly determine market value. The range of 12¢ to 12½¢, as to delivery, is quoted.

COKE—Imports the past week aggregate 2001 tons from Newcastle, England. The local market is reported unchanged.

COAL—Imports the past week aggregate as follows: From Seattle, 1572 tons; Sydney, 3666; Departure Bay, 835; Nainamoo, 4700; Comox, 4300; Swansea, 5695; Liverpool, 2400; Tacoma, 2050; Cook's Inlet, 152. Total, 24,810 tons. The market is reported steady for spot and near by. It is said that fully three-quarters of the cargoes on the way are carded for. For loading, a stronger tone is reported, owing to ships asking more money for freight. The registered tonnage loading at and on the way from Australian ports aggregate as follows: Newcastle, N. S. W., for San Francisco, 67,077 and 15,662 tons for San Diego; from Sydney, 952 tons for this port. Total, 91,785 tons register.

CEMENT—There are now fully 160,000 barrels of Portland cement on hand in this market, while there are afloat from British ports alone not less than 180,000 barrels. From Antwerp and Hamburg there are probably 50,000 barrels on the way. All these cargoes should arrive before the close of the year. The annual consumption in this market is from 350,000 to 400,000 barrels. The twelve months following July 1st last will probably see the largest figures exceeded. The present prices rule from 50 to 60 per cent below those charged a year ago. Some of the cheaper grades, such as the Bilglen product, are selling as low as \$2.05 a barrel, while the very best grade of London Portland cement, such as the "Gillingham" and "K. B. & S." brands, may be had for from \$2.40 to \$2.50 a barrel. Encouraged by the cheap rate, many builders are using cement instead of brick for foundations.

The company owning the iron mines 18 miles southeast of Newberry will establish their works at Newberry, a station on the Atlantic & Pacific railroad, 119 miles east from Diggett, and 148 miles west from Needles. There is plenty of water at this locality, and the situation of the land, and of the contiguous mountains, is all favorable. Mr. C. L. Hahne, of Albuquerque, accompanied by Mr. Jesse Anthony, of the same city, will in a day or two come out to Newberry and begin the survey of the grounds for the erection of their plant as well as the road from Newberry to the mines for a distance of fifteen miles. The expenditure required to erect the plant, build the road, and get the whole thing in working order, will not be less than \$500,000, but the company is said to be backed by men of unlimited means.

Mining Share Market.

Mining shares the past week under review were very strong on Thursday and held fairly firm on Friday, but after the regular call on Saturday, under systematic cross orders, they began to set off. With Con. Virginia's battery assays said to be purposely made low on that day and bear points sedulously circulated, the pool's brokers were able to send prices still lower on Monday and Tuesday without losing a share of stock, but instead they gained considerable desirable shares. These breaks, which enable them to systematically milk the street of mining shares, it is thought by well-informed operators, mean something more than a bluff and outsiders who have their stocks paid for will yet come out large winners, but before top prices are reached the pool will unquestionably not leave a stone unturned to frighten them into selling. The writer is still of the opinion expressed last July, that the chief move in the deal this fall is in the North End shares with the Middle a good second, and the Gold Hills only moving in sympathy. Yet the latter act very much as if they are likely to soon do something more than sympathize, for there has been and still is quiet but persistent buying of certain shares, and while there may be more assessments to lead outsiders astray, yet this buying by the pool is a good sign, particularly when it is considered that the water can be and probably will be taken out before the close of the year. It is known that there is below the water level rich ore to the east in two or more of the mines which goes about \$60 per ton. Aside from this it is positively known that to the west in Crown Point and running into the adjoining mines, there is high-grade ore extending from the 500 down to the 800-foot level. In Seg. Belcher there is rich ore, a continuation of that found in Belcher, but which was worked out of the latter mines.

While this is the case at that end; in the group of mines that work from the Ward shaft, work is now being done to exploit, there is some high-grade ore which is liable to be struck unless work is delayed very soon. When the powers that be were advancing the price of Potosi, rich ore was reported in the winze, where has it mysteriously gone? If the ore is as rich as it was officially claimed, why is it not shown up and extracted for the benefit of shareholders? In Chollar, to the west, there is a 500-foot ledge with several feet said to be carrying high-grade ore. This was run into some time ago. We should think the stock, under the depression which has ruled in it for weeks past, has been sufficiently concentrated to show up some of this ore, unless it pays the pool better to have it milled for the benefit of a reported ring. It is generally claimed that the Levy-Harmon Consolidation ought to show up the rich ore found to the west in both Savage and Hale and Norcross, but perhaps they wish to collect another assessment first. Miners say that both mines ought to be paying dividends instead of collecting assessments. Passing to the North End group, the writer is informed that on the 1200-level in Best and Belcher, near the Cons. Virginia line, rich ore can be run into within a few days, but instead of doing so the work in the mine appears to be of a "dead work" character. It is well known in mining circles that Cons. Virginia has rich ore to the west, but perhaps the management fears suits, if it is taken out, but then shareholders in this mine have, so far as the writer personally knows, no just cause for complaint, as it is the only mine on the ledge that gives them dividends and not assessments. In Andes they can tap the rich lode in the old Burning Moscow ground. Ophir can do the same, and it is said, has done so on the 800-foot level. In Mexican why is not the ore found to the west on the 1455-level shown up? When run into, the stock was advanced to about \$9 a share. In Union the ore reported in the days of the late J. C. Flood can be shown up to good advantage, as can the ore to the west in Sierra Nevada.

In outside shares, the Quijotas continue lifeless, as do the Tuscaroras, although prices ruling for the latter ought to tempt buyers. In the Bodies more has been done. The assessing of Mono and Bodie, with one liable to come on Bulwer, shows that they will probably have foster parents at an early day, in which event lively moves in the shares of that district can be looked for. The mines never promised so well for shareholders as they now do and persons who buy the shares for cash and pay the assessment will, with proper care, make several good turns. An interesting correspondence is going on between Dr. W. N. Griswold, President, J. H. Tingman, Secretary of the Mining Stock Association, and Col. J. W. Mackey regarding the present system of milling ore on the Comstock. It is to be hoped that the interested parties will see their way clear to make the correspondence public for the benefit of shareholders in the Comstock mines. News from the Comstock mines is not only very interesting, but of an important character, provided present work is not stopped or turned in a wrong direction. In Sierra Nevada they are in promising ground, as they are in Union. In Ophir, on the 800-foot level, important work is said to be doing in the old Burning Moscow ground and that rich ore has been struck. From Mexican, on the 1455-foot level, good news comes to hand. It now looks as if they will do something toward showing up the find made at the time the stock went up to \$9 per share. It is said that in Con. Virginia nothing much will be done toward showing up ore until soon after Col. Mackay returns from the East. In the Middle group of mines more exploiting is under way. In Savage an improvement is reported, while in Hale and Norcross ore extracting has begun. The work in the various mines in the Gold Hill group is being closely watched with much interest by mining men in general.

There are at present more coal-laden ships bound for San Francisco than ever before known, while many more are listed to leave Australian ports within the next thirty days. In the opinion of a large importer the imports of coal this year will reach 1,500,000 tons.

THE MINES BUILDING—Work upon the mines and miners' building of the World's Fair has progressed so far that the first of the trusses to support the immense central arch, 120 feet high, has been put in position.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

COMPANY AND LOCATION.	NO. AMT. LEVIED.	DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co., Nevada.....	42.....	Aug 4, Sept 7, Sept 23.....	O. L. Perkins.....	331 Pine St
Bodie Cons M Co., California.....	13.....	Sept 22, Nov 6, Dec 3.....	H. D. Walker.....	309 Montgomery St
Branswick Cons M Co., California.....	2.....	Sept 11, Oct 8, Nov 15.....	J. Stadfield, Jr.....	309 Montgomery St
Cons B. G. & H. M Co., California.....	3.....	Sept 10, Oct 14, Oct 31.....	T. Wetzel.....	320 Sansome St
Gray Eagle M Co., California.....	25.....	Sept 12, Sept 14, Oct 6.....	A. W. Barrows.....	303 California St
Inyo Marble Co., California.....	14.....	Aug 21, Oct 5, Oct 23.....	G. W. Luce.....	137 Montgomery St
Julia Cons M Co., Nevada.....	24.....	Aug 16, Sept 6, Sept 20.....	T. S. Stanford.....	307 Montgomery St
Keystone Cons M Co., California.....	12.....	Sept 16, Oct 21, Nov 23.....	J. H. Isham.....	310 Pine St
Locomotive M Co., Arizona.....	21.....	Sept 1, Oct 5, Oct 24.....	A. H. Fish.....	359 Montgomery St
Martin White M Co., Nevada.....	26.....	Sept 21, Aug 14, Sept 21.....	A. B. Cooper.....	325 Montgomery St
Mexican M Co., Nevada.....	43.....	Aug 10, Sept 14, Oct 6.....	C. Elliott.....	309 Montgomery St
Mono M Co., California.....	31.....	Sept 17, Oct 27, Nov 30.....	H. D. Walker.....	309 Montgomery St
Monte Christo M Co., Nevada.....	5.....	Aug 17, Sept 23, Oct 14.....	L. Leavitt.....	533 Kearny St
New El Dorado M Co., California.....	2.....	Aug 4, Sept 10, Oct 2.....	J. W. Pew.....	310 Pine St
North Belle Isle M Co., Nevada.....	18.....	Aug 28, Oct 2, Oct 30.....	J. W. Pew.....	310 Pine St
North Gould & Lury M Co., Nevada.....	12.....	Sept 1.....	C. H. Mason.....	309 Montgomery St
Peckless M Co., Arizona.....	12.....	Sept 11, Oct 21, Nov 18.....	A. Waterman.....	309 Montgomery St
Silver King M Co., Arizona.....	7.....	Aug 18, Sept 29, Oct 27.....	J. W. Pew.....	310 Pine St
Teresa M Co., Mexico.....	5.....	Aug 11, Sept 14, Sept 30.....	A. Oheimann.....	320 Montgomery St
Union Cons M Co., Nevada.....	44.....	Aug 31, Oct 5, Oct 26.....	A. W. Barrows.....	353 California St
Weldon M Co., Arizona.....	4.....	Aug 25.....	A. Waterman.....	309 Montgomery St
Yellow Jacket M Co., Nevada.....	49.....	Aug 31.....	W. H. Blavet.....	Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Presidio M Co.....	L. Osborn.....	309 Montgomery St.....	Annual.....	Oct 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co.....	T. Wetzel.....	320 Sansome St.....	10.....	Aug 15
Cons Cal & Virginia M Co., Nevada.....	A. W. Barrows.....	309 Montgomery St.....	50.....	Aug 17
Copple M Co.....	E. M. Hall.....	314 Montgomery St.....	30.....	Sept 10
Idaho M Co., Grass Valley.....	.....	Grass Valley.....	3.....	Aug 4
Mayflower Gravel M Co., California.....	D. M. Kent.....	330 Pine St.....	70.....	Aug 10
North Banner Cons M Co., California.....	T. J. Mitchell.....	Grass Valley.....	70.....	Aug 20
North Commonwealth M Co., Nevada.....	J. W. Pew.....	310 Pine St.....	25.....	June 17
North Star M Co., California.....	D. A. Jennings.....	401 California St.....	50.....	Apr 8
Pacific Coast Borax Co., California.....	A. H. Clough.....	250 Montgomery St.....	1.....	Sept 10
Standard Cons M Co., California.....	J. W. Pew.....	310 Pine St.....	10.....	Oct 26

San Francisco Metal and Coal Market.

THURSDAY, September 24, 1891.	
ANTIMONY.	STEEL.
Per lb.....	13½ English, lb.....
BORAX.....	16 @ 20
Refined, in car lots.....	8½ S. K. Diamond tool.....
Refined, do.....	9 @ 9
Concentrated.....	8 Pick & Hammer.....
All grades showing at advance.....	7½ Machinery.....
	4 @ 10
COPPER.	TIN PLATE.
Bolt.....	B. V. steel grade.....
Sheeting.....	12½ Spot.....
Ingot, tubing.....	15 Charcoal.....
Do, wholesale.....	14 Do roofing.....
Fire Box Sheets.....	24 Do, 20x23.....
IRON.	COAL.
Bar, hase.....	31 irreg. hase.....
Norway, hase.....	51.....
P. G. Iron.....	Spot. Load. Spot. FROM YARD—PER TON.
Ephraim.....	27 00 Wellington.....
Glenbrook.....	27 00 Greta.....
Am. Soft, No. 1.....	28 00 Carbon Hill.....
Oregon Pig.....	25 00 Nainamoo.....
Puget Sound.....	27 00 Gilman.....
Clay Lane White.....	23 00 Seattle.....
Shots, No. 1.....	25 00 Goss Bay.....
Langdon.....	25 00.....
Thorndike.....	26 00 Egg hard.....
Gartsherr.....	26 00 Oumberland, in sacks.....
Sarrows.....	26 00 Do, bulk.....
Caracoles.....	26 00 Do, bulk.....
CHROME IRON ORE.	SCOTCH SPLIT.
Per ton.....	10 00 @.....
	By the load.....
	English, to load.....
	Do, spot, in bulk.....

Eastern Metal Markets.

By Telegraph.	
New York, September 24.—The following are the closing prices the past week:	
Silver in Silver in London, New York.	Copper. Lead. Tin.
Thursday.....	44 13 16 062 12 30 4 474 20 05
Friday.....	44 13 16 062 12 30 4 460 20 05
Saturday.....	44 13 16 062 12 30 4 460 20 05
Monday.....	44 13 16 062 12 35 4 624 20 05
Tuesday.....	44 13 16 97 12 40 4 524 20 05
Wednesday.....	44 97 12 40 4 65 20 05

Quicksilver is very strong with a prevailing opinion that higher prices will obtain. Borax is strong with a good demand, iron is to better inquiry. Tin is fairly steady. Lead is strongly held. Copper is bigher with a very strong tone.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

AMERICAN COMPOSITION PIPE AND PILE ARMOR CO., Sept. 18. Capital stock, \$1,000,000. Directors—W. R. Brone, C. J. Colley, E. S. Lemme, E. F. Badgley and F. A. McGee.

ARMONA ORCHARD AND VINEYARD CO., Sept. 18. Capital stock, \$95,000. Directors—E. K. Howe, W. W. Brown, J. A. Eveleth, J. W. Barbour and D. H. Porter.

EL SUENOY G. & S. M. CO., Sept. 19. Location, Tia Juana, Lower Cal. Capital stock, \$1,000,000. Directors—Manuel M. Ayala, Temescal; Bruno Z-pada, Tia Juana, Lower Cal.; Wm. Boese and Ramon L. Briones, Oakland, and Guadalupe M. de Boese, San Francisco.

BITUMEN CONS. M. CO., Sept. 19. Capital stock, \$300,000. Directors—J. A. Fairchild, E. F. Spence, G. M. Perine, A. Walrath, A. C. Bassett and J. H. Swift.

BLACK SAND MINERS—It is reported, says the *Coggett Herald*, that the black sand mine men, who came to Port Orford recently from California with a high sounding company name and large pretensions for revolutionizing that business on the beach, started in on a large scale, for a time working night and day, has since skipped the country, leaving their tools and machinery, which has been attached for wages due the miners and workmen.

WHILE the Astin (N. v.) *Advocate* says the outlook for a revival of the mining industry will bring back many old-time Astin miners, it thinks it will be quite a little while before the company can employ many more miners than are now there or very near by. At least it would be better to see further along before making a big rush for Astin.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 3.		WEEK ENDING Sept. 10.		WEEK ENDING Sept. 17.		WEEK ENDING Sept. 24.	
	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
Alpha.....	.60	.65	.55	.65	.55	.60	.55	.65
Andes.....	.15	1.20	1.10	1.25	1.20	1.30	1.05	1.25
Belcher.....	1.10	1.25	1.05	1.15	1.05	1.15	1.05	1.15
Belle Isle.....	.40	.50	.40	.50	.40	.50	.40	.50
Bodie.....	.35	.45	.35	.45	.35	.45	.35	.45
Bullion.....	2.00	1.80	2.15	2.00	2.15	2.05	2.15	2.05
Bulwer.....	.55	.60	.55	.60	.55	.60	.55	.60
Bulwer.....	.20	.25	.20	.25	.20	.25	.20	.25
Commonwealth.....	.10	.15	.10	.15	.10	.15	.10	.15
Cons. Cal. & V.....	6.12	6.75	6.25	6.75	6.25	6.75	6.25	6.75
Challenger.....	.80	1.35	1.25	1.40	1.40	1.20	1.50	1.80
Chollar.....	1.85	2.10	2.00	2.10	2.00	2.10	2.00	2.10
Consolidation.....	3.70	4.00	3.90	4.00	4.00	4.00	4.00	4.00
Cons. Imperial.....	.40	.50	.35	.50	.50	.40	.45	.50
Crown Point.....	1.55	1.70	1.55	1.80	1.55	1.80	1.55	1.80
Orocrack.....	.05	.05	.05	.05	.05	.05	.05	.05
Del Monte.....	.20	.20	.20	.20	.20	.20	.20	.20
Exchequer.....	.60	.70	.60	.70	.65	.75	.65	.70
Grand Prize.....	1.60	1.70	1.55	2.00	1.55	2.15	1.75	2.10
Gould & Curry.....	1.60	1.70	1.55	2.00	1.55	2.15	1.75	2.10
Hale & Norcross.....	1.60	1.70	1.55	2.00	1.55	2.15	1.75	2.10
Idaho.....	.25	.30	.25	.30	.25	.30	.25	.30
Justice.....	.55	.65	.55	.65	.55	.65	.55	.65
Kentuck.....	.25	.30	.25	.30	.25	.30	.25	.30
Lady Wash.....	.10	.10	.10	.10	.10	.10	.10	.10
Potosi.....	.25	.30	.25	.30	.25	.30	.25	.30
Mexican.....	2.10	2.25	2.00	2.30	2.40	2.45	2.45	3.05
Narajo.....	.20	.20	.20	.20	.20	.20	.20	.20
North Belle Isle.....	.20	.40	.25	.20	.25	.15	.25	.25
New Queen.....	.10	.10	.10	.10	.10	.10	.10	.10
Old Bull.....	.10	.10	.10	.10	.10	.10	.10	.10
Ophir.....	3.55	3.75	3.65	4.10	3.85	5.12	3.85	5.00
Overman.....	1.05	1.60	1.15	1.45	1.26	1.50	1.20	1.60
Potosi.....	3.00	3.75	3.85	3.40	3.95	3.35	3.60	3.10
Peckless.....	.10	.10	.10	.10	.10	.10	.10	.10
Piedmont.....	2.50	2.75	2.65	3.45	3.05	3.25	2.45	3.10
S. B. & M.....	.65	.75	.70	.80	.75	.90	.80	.90
Sierra Nevada.....	3.00	3.12	3.25	3.50	3.15	3.60	3.20	3.50
Silver Hill.....	.15	.20	.15	.20	.15	.20	.15	.20
Scorpion.....	.15	.20	.15	.20	.15	.20	.15	.20
Union Cons.....	2.15	2.30	2.15	2.45	2.35	2.75	2.15	2.70
Utah.....	.70	.75	.80	.70	.80	.65	.75	.70
Yellow Jacket.....	1.35	1.70	1.25	1.50	1.30	1.50	1.16	1.45

Sales at San Francisco Stock Exchange.

THURSDAY, September 24, 9:30 A. M.	
100 Alta.....	155
300 Andes.....	1.10
200 Belcher.....	.60
100 Belle Isle.....	.55

Assessment Notices.

INYO MARBLE COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of August, 1891, an assessment of \$10.00 per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary at the office of the Company, 137 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 5th day of October, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 23d day of October, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

G. W. LUCE, Secretary.

Office, 137 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

NEW EL DORADO GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, El Dorado County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 4th day of August, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Cert.	No. Sh. res.	Am't.
W N M rino, Trustee	48	20	\$ 1 00
W N Martin, Trust e	64	20	1 00
W N Martin, Trustee	69	10	50
W N Martin, Trustee	73	10	50
J P Stough	81	5,000	250 00
J Stou h	82	2,400	100 00
J P Stough	83	1,000	50 00
J P Stough	84	1,000	50 00
J P Stough	85	500	25 00
J P Stough	86	500	25 00
J P Stough	87	50	25 00
J P Stough	88	500	25 00
J P Stough	89	100	5 00
J P Stough	90	100	5 00
J P Stough	91	100	5 00
J P St vgh	92	140	5 00
J P Stough	93	50	2 50
J P Stough	94	50	2 50
W O Bucklan l	97	100	5 00
J P Stough	104	13,500	675 00
W N Martin	107	5	25
W N Martin	108	35	1 75
John Fe rn, M D	109	100	5 00
John Fe rn, M D	110	100	5 00
J n Fe rn, M D	111	100	5 00
John Fe rn	112	700	35 00
F J Lo h	116	50	2 50
F J Locher	117	50	2 50
W N Martin	118	140	5 00
W N Martin	119	140	5 00
Hild & Co, Trustees	125	160	5 00
B lwin Garner, Trustee for W N Martin	127	100	5 00
J L Armstrong, Trustee for W N Martin	130	100	5 00
J L Armstrong, Trustee for W N Martin	131	100	5 00
W N Martin	146	800	40 00
E H Neville	147	20	1 00
Mrs S v Decker	148	100	5 00
W N Martin, Trustee	154	1,000	50 00
W N Martin, Trustee	159	5	25
W N Martin	160	5	25

And in accordance with law, and an order of the Board of Directors, made on the 4th day of August, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California, on FRIDAY, the 23d day of October, 1891, at the hour of one o'clock p. m. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of the sale.

J. W. PEW, Secretary.

Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 25) levied on the 12th day of August, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Cert.	No. Sh. res.	Am't.
A W Barrows, Trustee	559	1,000	\$50 00
A W Barrows, Trustee	562	500	25 00
A W Barrows, Trustee	563	500	25 00
A W Barrows, Trustee	568	1,000	50 00
A W Barrows, Trust e	569	1,000	50 00
A W Barrows, Trustee	570	500	25 00
A W Barrows, Trust e	597	1,000	50 00
A W Barrows, Trust e	598	500	25 00
A W Barrows, Trustee	599	500	25 00
A W Barrows, Trustee	600	150	7 50
A W Barrows, Trustee	601	200	10 00
A E Brown, Trustee	267	100	5 00
S E Brown, Trustee	312	50	2 50
S E Brown, Trustee	536	515	25 75
O H Bogart, Trustee	447	5,000	250 00
O H Bogart, Trustee	448	1,000	50 00
O H Bogart, Trustee	449	1,000	50 00
O H Bogart, Trustee	450	1,000	50 00
O H Bogart, Trustee	471	1,000	50 00
O H Bogart, Trustee	473	214	10 70
O H Bogart, Trustee	474	100	5 00
O H Bogart, Trustee	475	100	5 00
O H Bogart, Trustee	488	105	5 25
S H Hall	598	50	2 50
W N Martin, Trustee	518	5,050	252 50
M M Rosekrans	39	600	30 00
Mrs M E Stott	184	500	25 00
C S Stout, Trustee	476	2,400	100 00
C S Stout, Trustee	477	953	47 65
W A Searles	226	445	22 25
W A Searles, Trustee	316	1,000	50 00
W A Searles, Trustee	418	1,000	50 00
W A Searles, Trustee	619	608	30 30
J H Turney	6	30	15 00
J N Taylor, Trustee	532	1,040	52 00

And in accordance with law, and an order of the Board of Directors, made on the 12th day of August, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 308 California street, San Francisco, California, on THURSDAY, the 6th day of October, 1891, at the hour of one o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

A. W. BARROWS, Secretary.

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Krochake's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

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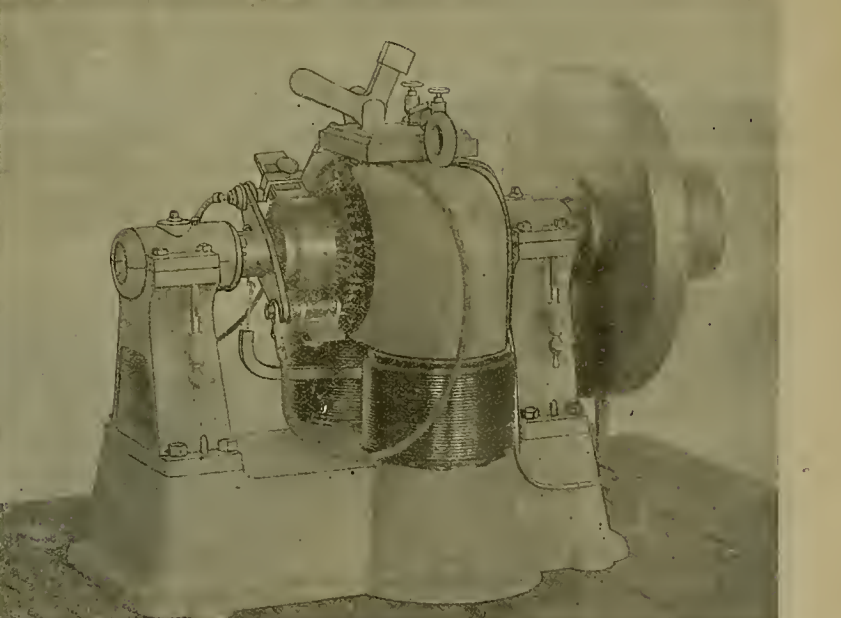
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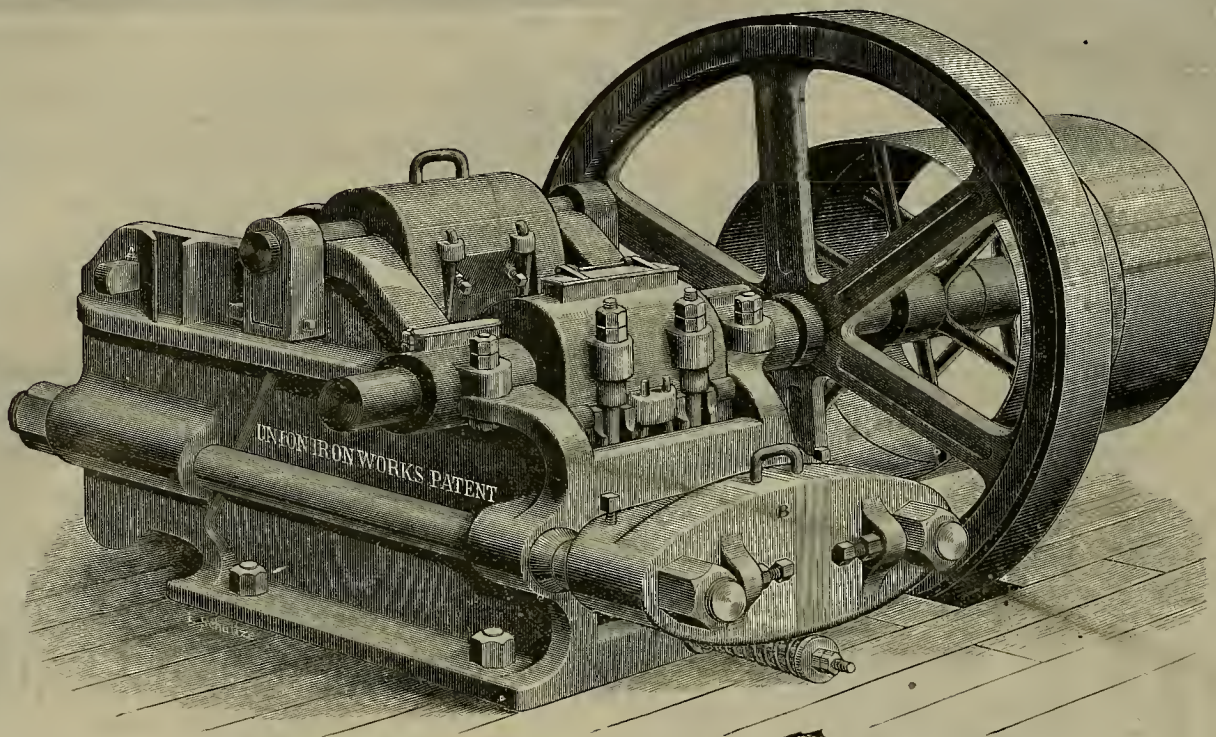
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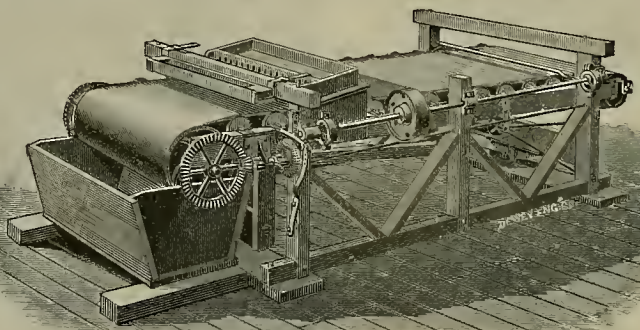
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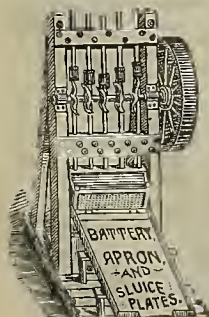
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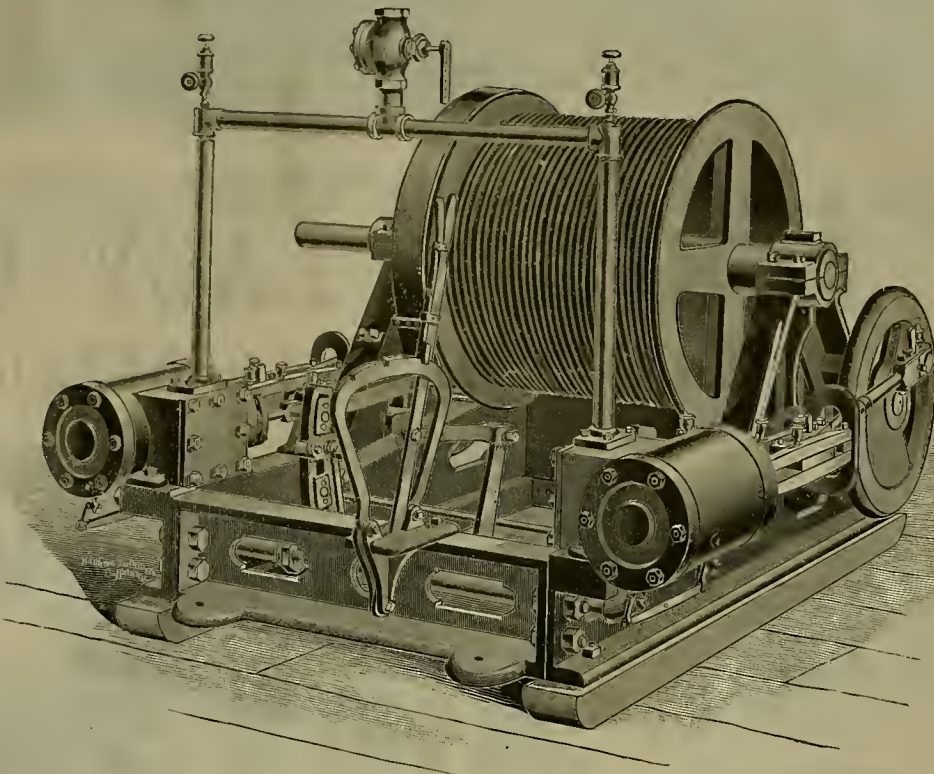
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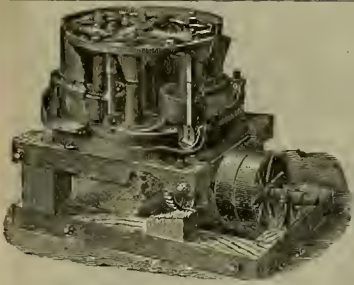
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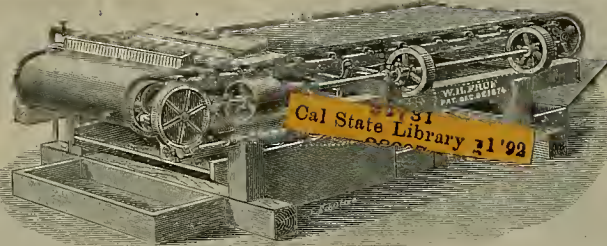
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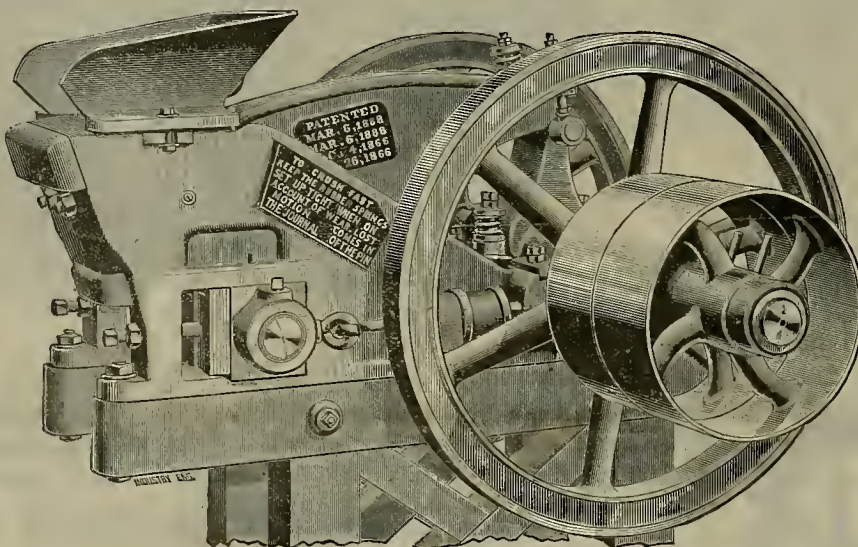
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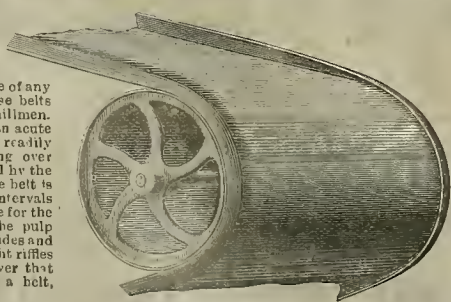
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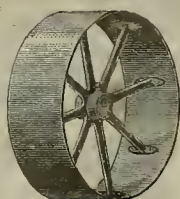
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VOL. LXIII.—Number 14.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 3, 1891.

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An Electric Mining Hoist.

One of our illustrations this week is of the mining hoist made for the Black Diamond Coal Mining Co. of Washington by the Electrical Engineering Co. of San Francisco. This hoist has been successfully working at the mines since April last.

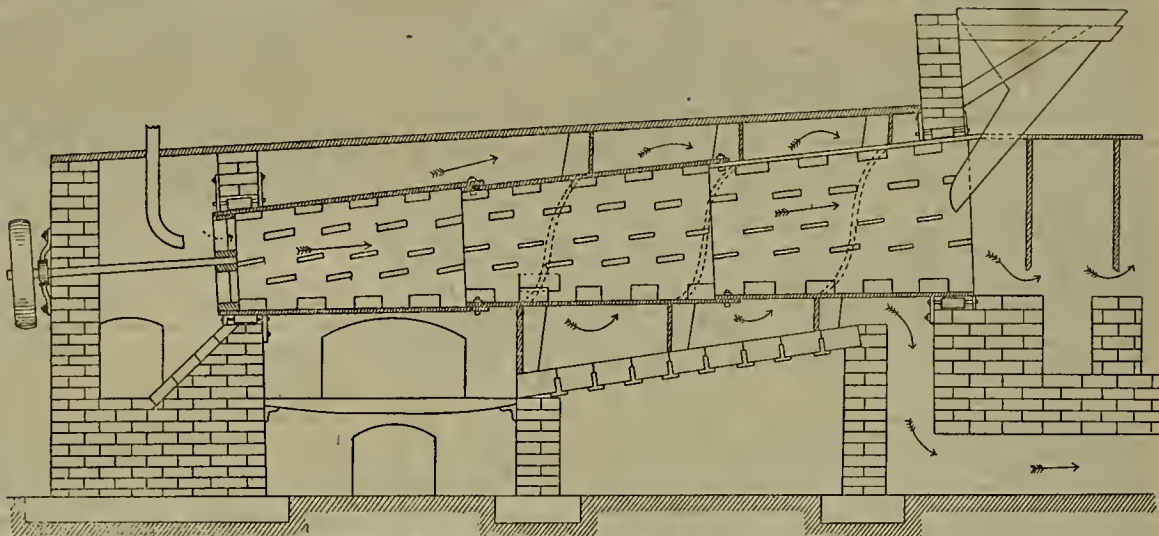
The dynamo illustrated in our issue of Aug. 29th is located near the mouth of the mine, and furnishes electrical energy for this hoist, which is at the head of a slope 3100 feet away in the mine. This slope is now 500 feet deep, and coal is hoisted from the 450-foot station, but sinking is going on to make it 900 feet, where another station will be located.

The stopping, starting and reversing movements of the hoist are effected by the movement, to or fro, of the one vertical lever.

But three-horse power of energy is absorbed by the conducting line and motor. This amount is far less than would be used to transmit the power necessary from the surface to the slope by any other known means. The Electrical Engineering Co. has taken the lead in manufacturing and installing electric mining plants on the Pacific Coast.

Underground Quartz Mills.

The discussion of milling Comstock ore has brought to the front rather an odd proposition, viz: the practicability of mining underground mills built above the Sutro tunnel level. The



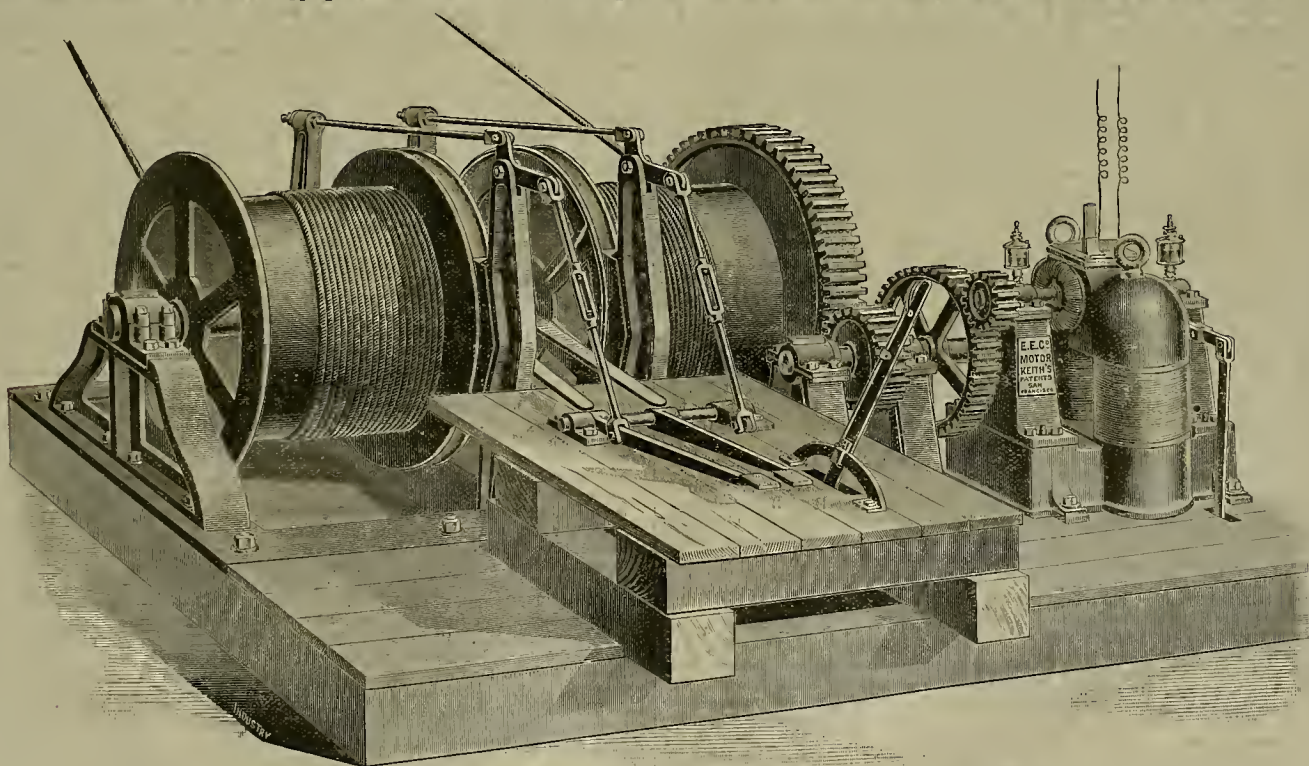
THE MOLESWORTH CALCINING FURNACE—See Page 213.

The chamber would have to be well supported for such a purpose, and in it stamps would be placed for crushing every ton of ore that would pay to work. For motive power to run the stamps and pans the water now flowing to waste through the tunnel could be utilized.

This would do away with the absurdity of shipping ore from where water is flowing to

In an interview with a leading mining man, he says, in regard to the above project: "I would excavate an opening on the 1500-foot level of all the ore-producing mines sufficiently large to accommodate my batteries and pans, and that chamber should be large enough to have many more pans than are run in the mills now, in order that each obarge should be

lial necessary to run 500 stamps. This underground mill, run by water produced from the mines, would reduce the cost of milling and mining to \$3 per ton. Not a pound of ore nor waste rock should be hoisted to the surface, thus saving the vast expense of handling, hoisting and transportation. I would hoist the hullion and the miners only."



80-HORSE POWER ELECTRIC HOIST FOR THE BLACK DIAMOND MINES.

writer has spoken to several practical mining men about the project, who one and all pronounce it practicable, as did a well known millwright who is an authority on such subjects.

In building a mill underground, a dome like chamber would have to be prepared on any level either on or above the Sutro tunnel level.

waste to another place where water is only obtainable during certain months in the year, and all this shipping is done at the extra expense of hoisting, handling and rehandling the ore several times, all of which costs money; and in addition to this, there is now an exorbitant obarge for transportation,

worked six hours to each pan, instead of three hours, as worked at present by a mill interest which is adverse to a careful working of ores for the mines. For one-half the cost of ore transportation to the Carson river a pump could be erected which would raise water anywhere above the Sutro tunnel level to give a

THE Stockton Iron Works, an old establishment, was partially destroyed by fire on Tuesday. The loss was about \$6000.

SAN FRANCISCO Trades Unions are contributing money to send to the destitute miners at Franklin, Washington.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Shasta County Mining Interests.

NUMBER 1.

[By Our Traveling Correspondent.]

Shasta has always had the reputation of having high-grade gold-bearing quartz mines. At the same time there is a general belief that the ores cannot be worked to a profit by free milling processes. I know of no county in the State where the ores are similar to those of Shasta. It is but natural that writers like Mr. A. Paul should conclude that the same conditions that exist here are to be found in all sections, if they are sought. I have seen here talc slate that assays in the hundreds, while the same slate, to all appearance, in the Gold Cliff mine at Angels goes but a dollar a ton. Now these Shasta people insist that the same gold values can be found elsewhere in the same character of slate by assaying, and charge that by the usual wet process only a small percentage of the gold value is secured. I was also shown a mixed quartz and talc slate vein matter that assayed very high, while the same looking vein matter in the Utica mine at Angels goes but \$4 a ton. Shelly, rusty quartz, that no miner would bother to mortar and that carries no visible free gold, assays in the hundreds, while quartz with a gray streak that could not be made to give up a color of free gold showed up in hundreds under assay. Quartz that apparently carried a small percentage of copper pyrites proved to be gold covered with a film of copper. All of these tests naturally bring the Shasta miner to believe that the miners in all the other portions of the State are losing dollars while saving cents. But a closer investigation shows that this high class of ore is not the average of the vein but a small spotted part, which, owing to its similarity to the vein matter as a whole, is exceedingly difficult to sort.

Peculiarities of Ores.

When ore carries a large percentage of mineral, the miner readily infers that there is a good lot of gold with it, but when, as in Shasta ores, the richest ore shows no mineralization, and can only be proven by assay, it is but natural that the whole should be run through a mill for its free-gold contents. I have gone to some length to elucidate this matter because millmen on the line of the mother lode have felt that Mr. Paul was intimating that the millmen of the State were running their mills merely to hear the stamps drop, and did not know nor care for their losses.

It will be seen that, if my conclusions are correct, the conditions are not similar. While I have not had ores similar to these high-grade ores of Shasta, from other counties assayed, yet I believe that the ores of this class are peculiar to Shasta and to certain portions or mines of Shasta. This is undoubtedly due to the country rock which in most sections looks, with its rich metallic color, rich enough to mill. In this rich porphyritic slate the vein matter is usually high in grade and not all free, as in the Calumet mine. In the black slate the ores are very free, as is shown at the Gladstone, where the mill tailings average but 20 cents a ton, which is far lower than the average of the mines on the mother lode. In the Granite the ores here reverse the usual order, and instead of being base or refractory, as in all the other mining counties save Fresno, they are the freest milling of any veins in the county. In going through the county, the fact that many of the mines are worked down to about water level only, conveys the impression that the veins give out in gold values in depth.

While my limited time would not permit of the investigation required to prove it, still all things would point to the conclusion that when these ores reached water level and became live ore, the free gold gave out, as the sulphurets were no longer oxidized and the gold set free; hence the belief that some of these old mines have only been worked down to their greatest, instead of least, value. What confirms me in this belief is the character and high grade of ore that is now being sorted and smelted from these old mines that never had, in all their past history, any ore of like value.

In addition to the quartz veins of the county, Shasta has in the Iron Mountain mine a deposit of mineral that is not excelled, if equaled, in any portion of the United States. To treat the ore of the county a great variety of processes have been employed in the past, with several modern methods. The MacArthur-Forrest cyanide process, among others, is now in course of trial. In addition, there are a number of the old dividend-producing stamp-mills.

Sorting Ores.

Some of these are running on ores that may be called strictly free milling, while others are on mines where the higher-grade ores are soaked and shipped to be smelted, and the ore not high enough in value to pay charges is milled. A few of the mines sort all of their ore, ship what is high enough in grade, and dump the balance. In some cases ore running \$40 a ton are thrown over the dump, as the gold is not free and it will not pay to ship. In addition to the large amount of ore shipped by the mines direct, Mr. Joseph Bell of Shasta has equipped sampling works at that

place where he samples and buys ore for shipment. His output this year will exceed \$100,000, in value. Mr. Bell is familiar with the Colorado method of sorting ores, and it is largely due to him that the mine owners have discovered the fact that their apparently barren ores are high in assay value, though poor in free gold. Perhaps the most interesting method now being tried for the extraction of the gold contents of the ores is

The McArthur Forrest Process.

Or the cyanide process, as it is generally called. Some time since, Mr. Almarin Paul of the Calumet mine, visited Denver, Colo., and inspected the process. Becoming convinced that the process was a success, he operated it on the ores of the Calumet mine. This test proving satisfactory, a company purchased the sole rights to Shasta, Trinity and Siskiyou counties, and incorporated under the title of the Shasta Gold Ex. Co., Almarin B. Paul, manager. The works are immediately opposite to the Calumet mine's mill and on the west bank of the Sacramento river. About two miles above Middle creek, and directly on the line of the Oregon & Cal. R. R.

The plant is intended solely for the working of the McArthur Forrest process, not alone on the ore of the three counties that the company owns entire, but for all ores that may be shipped from all portions of the coast. The situation is all that could be desired in railroad facilities, water and millsite that will admit of automatic handling of the ore. The plant will treat 10 tons of ore every 24 hours, and is so arranged that different lots of ore can be treated at the same time. In the treatment of the ore, the first operation is the drying of the ore. Then the ore is passed through a rock-breaker and into bins, from which it is fed into a Paul barrel-pulverizer, and when powdered, the ore is placed into agitators and a one per cent solution of cyanide of potassium added. After an agitation of six to 12 hours, the liquor is drawn off into filtering tubs. These filters are of wash gravel covered with canvas. The liquor passes through the filter and into storage tanks. From this, the solution is drawn into a chest of zinc filters, each filled with zinc shavings.

The liquor flows down through the first, up through the second, down through the third and so on out to the end of the eight filters. The gold is precipitated upon the zinc shavings in the form of a brown powder. When desired the chest is unlocked, the zinc shavings washed in clear water, which separates the gold. When it has settled the water is drawn off and the gold, in the form of a brown powder, melted into bars. The liquor from the filtering tank is pumped back up to the first tank and sufficient cyanide of potassium added to bring the solution up to the original one per cent. As will be seen the process is very simple, no roasting of ores being needed, and no high-priced chemicals required, with a very small loss of material used. The inventors claim that it is possible to treat all ores at a cost of from \$2.50 to \$3 a ton and save from 85 to 99 per cent of the gold and silver value.

The inventors claim that while the one per cent solution of cyanide of potassium will dissolve all of the gold and silver contents of the ore by their treatment the other metals are not affected. I have been repeatedly asked for information concerning this method and so have given it what might be called a good deal of "free advertisement," realizing that if the process will do all that is claimed for it, that it will give quartz mining a boom as great as that which hydraulic mining would receive were the injunction removed. As numerous parties have failed in making small working tests of this process, it may not be amiss to state that very often cyanide of potassium is not more than half to two-thirds full strength, and it is therefore necessary to know the exact per cent of the cyanide as well as to follow the company's method of treatment.

By the time this article is published the works will be in full operation, and once the matter is given a thorough working test Mr. A. Paul has promised to give the readers of the PRESS the results in one of his usual able articles.

The Gold Run Reduction Works.

W. P. Miller is superintendent of these works. They are located on Gold Run, 3 miles northwest of Redding, on the line of the California and Oregon Railroad. Mr. Miller has only a part of his works in place. When completed he expects to treat the base ore of this district by a process of his own that he is satisfied will give satisfactory returns.

The leading mines of Shasta are in zones, through which the veins are gold-bearing, with locations extending from one to the other, making an unbroken location, miles in length, but owned and operated by different mining companies. Away from these belts in these sections the veins seem to be either wanting or barren. There are, however, a number of mines scattered here and there throughout the county which as yet have not been traced and developed to any extent.

The Gladstone M. and M. Co.

C. J. Clarke is superintendent of this property. The company is a Cleveland corporation, who under Captain Clarke have secured a large area of mining ground adjoining the Gladstone, which is situated 4 miles northeast of French Gulch.

The company own the Gladstone, Helena, Shed, Jumbo, Climax, Cumberland, Bookeye

and Giant locations, all on one vein. The principal development is on, and the ore supply from, the Gladstone. The mine is developed and operated through a system of tunnels. No. 1, or the lower tunnel, crosses 230 feet to the vein, with drifts run 400 feet east and 500 feet west on the vein. The vein is cut 700 feet deep in these workings.

Tunnel No. 2 is 400 feet on the vein. No. 3 is 300 feet on the vein, while the fourth tunnel is in but 75 feet. The vein runs from two to twenty feet in width and carries throughout the workings an average value of \$9 a ton. This is not from shoot ore, but from the entire quartz extracted in and from all of the workings.

Contrary to the general opinion of Shasta's ore, the ore of the company's mines are exceedingly free in milling. The most careful and complete records of the mine's and mill's workings are kept by the superintendent, which show that the tailings at no time have gone over \$1 a ton, while the average is but 20 cents, a showing seldom equaled. The quartz is inclosed in slate walls. The mill is of 20 stamps, given 6½ inches drop, with double system of plates and concentrators. Owing to the very free character of the gold the ore's values are almost all caught in the battery.

In addition to the present plant the Captain is putting in three Edison electric drills, the first on the coast. Captain Clarke has been extensively engaged in mining all over the mining sections of the United States, but is convinced that in the Gladstone, where all the ore from a distance of 2000 feet averaged \$9 a ton, with a two to twenty foot to draw on, that he has "as good as there is a-going," and everything looks that way.

Other mines of the county I will mention in my next letter. E. H. SCHAEFFLE.

Washington Mines.

The Cascades Rich in Metallic Wealth.

EDITORS PRESS:—Last year I wrote you an article concerning the mining outlook of the "Evergreen State," as known at that time, and now I have a great deal more to offer on the subject.

During the past year I have been actively engaged in the pursuit of exploration and mining from the Columbia river to the British line. Most of my work and observations are being confined to the grand old Cascade range itself, and I find in these mountains

Metallic Wealth

That will insure vast fortunes to a great number of our citizens. Here we find gold, silver, copper, lead, iron and other mines in goodly numbers and of splendid richness. All of Western Washington is underlaid with extensive coal measures. Millions of acres of these coal beds are already known. Nor is this all. The magnificent evergreen forests amount to considerable, as there are no better timber lands in the United States. It requires no genius to foretell the import of all this. The implication is obvious. In the near future this State of Washington will stand supreme in its wonderful natural resources and become a commonwealth second to none in Uncle Sam's domain.

We have the metal, the coal, the timber and the soil. Our climate is salubrious and delightfully temperate, and the man that don't like our weather, rain, sunshine and all, of course, he ought to be sent to "Sheol." No doubt about it. Perfectly natural. Why shouldn't he be? We have no such place here, and as a reminder of the fact, there are nine Seattle "ministers" to-day playing against nine Seattle lawyers in a game of baseball. Of course there are a few people here who have not "gone crazy" on "town lots" and baseball, but the "infection of amusement" is as contagious that just what you don't expect is sure to come true. Pardon the digression. Washington mine! Yes, we have them already by the hundreds. In a dozen different districts along the Cascades there have been numerous and valuable discoveries made this season. The great lead-copper-silver belt lies along the summit region, on both sides of the range. The outcrops show on tops of the mountains, on the sides, and in the bottoms of the deep canyons.

Both east and west from the divide, for 20 miles, and along the great range for 300 miles the formation is geologically favorable for the existence of rich and extensive mines. The writer has already examined many valuable properties. These are gold, silver, copper and lead and range in grade from \$10 into the thousands per ton. Placer gold occurs also, and such should be looked for in the canyons and creek beds cutting through the auriferous quartz lodes. Lying before me now is a handsome \$50 nugget, recently taken out, and it is a fact that gold nuggets weighing over 50 ounces have been found in the Cascades of Washington. The mining outlook is indeed bright in this State, and during this season millions of dollars worth of mining property has been discovered.

A splendid beginning has been made. Our future is assured from the simple fact that our mountains are highly metalliferous. *Au revoir.* Seattle, Wash. CHAS. F. BLACKBURN.

The breaking of the pump-rod at the Alta mine, Virginia, last week put several men in a perilous position. They were imprisoned underground 14 hours, but came out all right.

Developments in Mariposa County.

The San Rafael Mine and Yosemite Park.

EDITORS PRESS:—Whenever there is any possible chance for a growl in Mariposa county about hard times, etc., the growl will come forth. It is therefore not more than right to set forth if anything occurs which puts the resources of Mariposa county in a favorable light. Such an occurrence is the development of the San Rafael mine, near the old mining village of Colorado, and owned by Mr. John Francis and other gentlemen from San Jose.

It is not a new discovery of a hidden mine, either. It is a vein with large outcroppings that has been known ever since the county was settled. It had been taken up and held for years by some Mexican miners, who, it is presumed, whenever they had to pay for some grub, went there and panned out as much gold as was needed at the time, but anything like systematic work had not been done on the vein till Mr. Francis, who had got some inkling of it, looked at it, prospected and boned it. He then went to work, run in some drifts at one place, and sunk a shaft at another place, and finding a good vein in the drifts and extraordinary rich ore in the shaft, but also a great deal of water, started a drainage tunnel at the proper place to drain the mine. Before the tunnel was in far enough to strike the vein the bond was about to expire, so Mr. Francis bought the mine outright. Since the purchase the vein has been struck in the tunnel. It is there about six feet thick, consisting of ribbon ore, which prospects by mill process for the whole six feet of the vein from \$8 to \$10 per ton.

The developments are as follows: The shaft is 40 feet deep, showing a vein of an average thickness of six feet, and at the bottom, where it prospects better than in any other place of seven feet, the ore, by milling process, will pay \$50 to \$60 per ton.

Something over 500 feet east of the shaft, in a gulch where the vein showed big, a drift was run in each way from said gulch; the drift running west toward the shaft is in 225 feet. The vein there averages five feet in thickness. The drift running east is 220 feet in and the vein averages 3½ feet. The ore in the drift gives a mill test of \$18 per ton.

The drainage tunnel is in 535 feet. It is perpendicularly 300 feet below the surface of the vein, where it strikes it. As the vein pitches about 60° south, it will give a lift of about 350 feet on the vein. The tunnel runs water enough to run 15 to 20 stamps. The owners own water privileges besides to run 15 to 20 stamps more. The vein is in a black slate formation, which is strongly mineralized with iron pyrites, and runs east and west, dipping south at about 60°. It is conveniently accessible by a good wagon-road, and the adjacent country is well provided with timber.

There is one circumstance connected with this mine, on which the people of Mariposa county are to be especially congratulated, and that is that this mine is outside of that creation of the last Congress—the Yosemite Park—by which name the territory set apart by the act of Congress approved Oct. 1, 1890, "setting apart certain tracts of land in the State of California as forest reservations," is generally known. The San Rafael mine just lies about 1½ miles west of the western boundary line of this Park. Therefore, it is not included in the territory, in which it will be the duty of the Secretary of the Interior, according to the Act, "to preserve the mineral deposits from injury and retain them in their natural condition," thereby smothering valuable interests and choking off all enterprise to develop them. But this mine will be worked, and will give employment to many miners and other laboring men. It will cause the construction and erection of valuable machinery and will help business of all kinds. The treasures extracted will course through thousands of the arteries of commerce, and it is to be hoped its owners will be enriched.

This brings home the question, How many many mines like this may not be contained in this Congressional creation of the Yosemite Park as a forest reservation? There are in townships 2, 3 and 4, south of ranges 19 and 20 east M. D. M., all in this reservation, below the Yosemite valley, and nearly entirely in Mariposa county, the Hite, Crauberry, Rathford, Ferguson, Feliciano, Sweetwater, Bear Creek and other mines, that are known to have produced, not a million, but millions, of dollars in gold. There are other mines and mining locations, too numerous to mention, that only await development. There are large districts known to be auriferous, but almost entirely unprospected yet; there are large deposits of marble and other minerals, which will be of great value whenever they become practically accessible. How many mines of enormous value may not be contained in the six townships above mentioned? For what good, for whose benefit, are those mineral deposits to be "retained in their natural condition"? As a forest reservation? When there are on stretches of miles and miles, in fact when on three-fourths of the townships mentioned there are no forests at all, when in other portions forests are so situated that, on account of their difficulty of access, they never will be commercially available.

Some portions of these townships contain as fine forests as there are in the world, and they

are also easy of access, but do not on people need some timber also? And the cutting off of full-grown trees, instead of letting them fall down and rot, does not destroy a forest. Go the contrary, by giving light and air, it encourages the new growth to spring up spontaneously.

We do not mention the agricultural and horticultural interests that are threatened to be smothered by this Congressional creation, as we only set out to speak of mines.

That the San Rafael mine is not on this so-called Yosemite Park, we consider a downright streak of luck for Meripose county; in having a vein that has held open and in plain sight for over 40 years, promising to become one of the richest mines this county ever had, as soon as there was a pick struck into it in earnest, is also—luck!

We believe there is more such luck lying around here, and would be found if it was looked for.

N.

Nevada Miners' Unions.

EDITORS PRESS:—The Gold Hill Miners' Union is the pioneer union of the coast. It was organized December 8, 1866. It had 20 charter members, only one of whom is now living—Wm. McNamara, who is in his 62d year. Mr. McNamara is a tall, raven-haired six-footer and shows a rugged constitution. He had many interesting experiences to relate to your correspondent.

The Virginia City Miners' Union was organized July 4, 1867, with 65 charter members, six of whom are now living, viz.: Peter Leonard, Alex Ensey, Wm. Trize, Maurice Flynn, T. W. Goldworthy and Michael Cammelford.

The union has numbered over 1200 members and now has about 1140 in good standing. The union has a fine library hall, a two-story brick, 40x100, well lighted and heated, making it a pleasant home for miners. The library contains 4015 volumes, 26 papers and magazines, among which may be found the MINING AND SCIENTIFIC PRESS, which is highly prized. Here can also be found games of entertainment and amusement, and complete sets of prospecting tools for miner's use. T. H. Smith is the honored president and Bernard Coyle the rolls secretary.

GANO KENNEDY.

Miner's Mass Convention.

A mass convention of the miners of the entire Southwest is to be held in El Paso sometime in December. Prof. Chas. Longmire is exerting every effort and doing stalwart work to make of this convention the largest and most representative of the mining interest of any ever held. The convention is to be political in no sense whatever. The subjects to be considered are two in number, viz: The Alien Law and Free Coinage of Silver. Every mining camp and mine in the Territory of New Mexico, Arizona and Utah, and the State of Texas should be largely represented, and undoubtedly New Mexico, Arizona and Texas will have representatives from every camp and mine of value. As stated above, the convention is to be non-political in character and is gotten up with a view to obtaining the concerted action and combined support of the miners of the State and territories named, upon these subjects, which are of such vital interest to miners of the Southwest. The Alien Law has virtually closed the mines of New Mexico, Arizona and Utah. Foreign capital, which would have been invested in our mines, and made of many of our prospectors and miners men of wealth, has gone to Colorado and other States which this legislation did not affect. This is food for the thought of New Mexico miners and there is ample time between now and December to reflect upon the subject. The subject of "free lead" will not be sprung and if you are for "Free Coinage" of the American silver product only, you can go to El Paso with the assurance that there will be scores there who are with you on the subject. As territories New Mexico and Arizona are next to powerless, but with the aid of the Texas delegation in Congress and a memorial to the President and Congress much and lasting good may result from this convention.—Rio Grande Republican.

Marine Engineers.

The annual election of the Marine Engineers' Beneficial Association, which took place last week, resulted in the following selection of officers: President, E. W. Tacker; Vice-President, F. A. Jones; Treasurer, G. H. Fairchild; Corresponding and Recording Secretary, Chas. True; Financial Secretary, W. D. Nelson; Chaplain, G. H. Crossley; Conductor, Thomas Spenser; Doorkeeper, Richard Pearson. The Past President is D. C. Martin. Board of Trustees—C. C. Looy, J. S. Richards, D. C. Martin, A. McDonald, J. J. Corcoran, W. K. Martland. Delegates to the National Convention—W. D. Nelson and A. H. Kress.

The Marine Engineers' Association is one of the strongest organizations on the coast. The members are drawn together by social as well as benevolent bands, and their meeting rooms are among the most popular headquarters in the city. About two months ago they moved into the apartments which they now occupy on Mission and East streets, and every day has witnessed something new in the way of decoration by the enthusiastic members.

The officers were most delightfully surprised

recently by the appearance of a handsome billiard table, on the rail of which was the inscription, "Presented to the Marine Engineers' Beneficial Association by the Risdon Iron Works." The Union Iron Works sent two handsome pictures, one of the Charleston and one of the San Francisco. A valuable library of marine works was the gift of W. T. Garrett's friends.

Patents to Hydraulic Mines.

B. J. Watson of Nevada City recently delivered an address before the Seventeenth Agricultural District Association, in which reference was made to the hydraulic mining question. Hon. Geo. Ohleyer of Yuba City took exception to some of the statements made and published an answer. Mr. Watson now returns the compliment and publishes an open letter (in the Sacramento Bee) addressed to Mr. Ohleyer. We have only space for an extract from Mr. Watson's communication in which he refers to the understanding the miners had with the Government when purchasing the gravel mines. Mr. Watson says:

"You also find fault with my statement that, after having paid double price for their mineral land, the Government had given the miners a patent permitting them to work by hydraulic process, had allowed them to expend the earnings of a lifetime under sanction of laws made especially for the purpose, by both State and National legislatures, and then permitted a Judge of one of its inferior courts, with one stroke of his pen, to render them penniless and to deprive them of the right to make a living the only way they knew how."

"You plead ignorance of such an understanding with respect to the sale by the Government of its mineral land."

"Without attempting to quote United States laws to show what was the understanding of the Government when it sold its mineral lands, I will content myself with drawing a conclusion from one of its patents, which I have before me."

"It is headed by a third of a page vignette, over which is printed 'The United States of America.' In the background is the National Capitol building with cities in the distance."

In the foreground is the picture of a hydraulic mine in full operation with five monitors playing upon a bank of gravel."

In the right foreground is a long stretch of pipe-line connecting with a tank reservoir, and other appliances familiar to hydraulic miners, while in the center foreground stands the American eagle, with wings outstretched, with *E Pluribus Unum* on the banner which streams from his beak, as if he were the guardian angel of the industry whose operations surround him."

My dear sir, what do you think the poor miner who had expended his life's earnings in developing such mineral lands thought that vignette meant when he received it.

Besides, in the body of the patent is clause fifth, which says: "That in the absence of necessary legislation by Congress, the Legislature of California may provide rules for working the mining claim or premises hereby granted, involving easements, drainage and other necessary means to the complete development thereof." What did this mean?

You know as well as I do that both Congress and the State Legislature passed laws encouraging gravel mining and the courts upheld the laws for over 30 years.

An honest miner would infer from these facts that the Government had authorized him to prosecute the business of mining in the latest approved manner, which way was pictured out on his patent granted by that Government.

The Government owned these mineral lands before it disposed of them to the miner, and it also owned, and still owns, the rivers into which the debris from the mines will necessarily run. It must of necessity have comprehended what it was doing when it entered into this contract with the purchasers of its mineral lands; but it permits one of its judges of a circuit court ("inferior court," if you please), to declare the contract off, after it had permitted and encouraged honest law-abiding citizens to invest their all in opening mines, building long and expensive canals, costly and spacious reservoirs, in erecting machinery and building cozy homes, all of which are rendered worthless by the court's edict. If that is not bad faith, cruel injustice and unheard of wrong, I am no judge of human action.

While residents of the valleys adjoining natural water courses have been damaged, they have suffered nothing like the injustice meted out to miners. The former knew when they bought their lands that mining had been in operation for a long period of time, and that the Government, which owned both agricultural and mineral land, and the valley streams, had not only permitted, but had encouraged the washing of gravel to obtain gold long before they purchased the lands adjoining those rivers. They went into the transaction with their eyes open.

But mining communities admit that where damage has resulted from mining, compensation should be given and means adjusted that will prevent future damage. They believe remedial measures may be adopted that will remedy the difficulty.

The Irrigation convention during its session this week in San Francisco declared unmistakably in favor of competing railroads. A permanent organization was perfected.

Esmeralda County Mines.

A Reno Gazette reporter accompanied S. A. Knapp of Hawthorne from Carson to Reno on Monday, and gleaned the following interesting news regarding the mining outlook of that county. Mr. Knapp sold the Fairmount mine, which is about 11 miles from Hawthorne, was being vigorously worked now. The mine was located about ten years ago, and about \$100,000 was taken out when the vein gave out and was lost. The mine has been worked for the past two years, and about 60 days ago the lost ledge was found, and some ore taken out, the first shipment of which has just been made of 8 1/2 tons and the returns showed 230 ounces of silver to the ton; and in taking out the ore, another ore body in the vein, lying under it, was found about ten inches wide, and within the last few days about one ton has been taken out that gave 2400 ounces, and the vein is going down very strong in the bottom and the company is following it down with a winze. This ore body promises to be very extensive, for they have traced the vein about 1200 feet, and the present depth of the work is about 200 feet below the surface on the pitch of the vein. Relative to other mines in that county, Mr. Knapp said: "There are a number yielding both gold and silver, among which may be mentioned the Pimlico. This mine produced from 1887 to 1889, \$150,000 in bullion, from which dividends amounting to \$77,000 were paid. The mine was closed down at that time on account of litigation, but work has been resumed within the last 30 days. The Lapanta, which is situated near by, has the peculiarity of being a gold mine in a limestone formation. This mine has produced about \$130,000 and paid about \$30,000 in dividends. The ore body has been followed for a total length of about 1600 feet and to a depth of about 150 feet. In its lowest workings, what promises to be a very extensive body of ore has been recently cut. The ore body being as high as 16 feet wide, contains iron and quartz, in which there is a pay streak of from eighteen inches to three feet wide, and which will mill about \$75 per ton. The balance of the ore yielding from \$8 to \$12. Work is being actively prosecuted at present opening up this find."

The Central mine, situated about 11 miles from Hawthorne, is a combination of lead, silver and gold—45 per cent lead, 35 to 40 ounces of silver and about \$35 in gold. The ore vein averages about two feet wide and has been followed by an incline on the vein to a depth of about 150 feet. The bottom shows very strong. Regular shipments are being made to smelters below.

In addition to the mines already mentioned, there are a great many prospects on which some work has been done, and are producing some ore. The Confidence mine, about 14 miles from Hawthorne, was worked for the first time about two years ago. The ore is silver, and some of it runs as high as 1800 ounces to the ton. Since work was commenced, the output of the mine has been about \$32,000—\$15,000 of which was paid in dividends. Within the past few days a very important strike has been made in the vicinity of this mine, and known as the Esmeralda. The ore is of the same character as the Confidence ore, black metal and horn silver. The vein is in lime stone, and a considerable portion of the gangue is spar. The vein being followed at present is about 18 inches wide, and the development of the same will be watched with a great deal of interest, as it is in a section of the country that has never been prospect before.

"You can count on the fingers of one hand all the prospectors in the county," said Mr. Knapp, "and every mine that has been developed has paid from the grass roots down."

Mr. Knapp said that there was a good field in Esmeralda for prospectors who had a little money and were willing to go into the hills and work and not do their prospecting around saloon stoves, as the most of the county is what is known as a "blind country." Besides the above-mentioned mines there is the copper district near Luning and the lead and silver mines near Marietta, which are producing wealth regularly. The silver mines in Gladding mountain and in Gille Mountain district and in the Liberty mining district, all of which are producing considerable ore, in every instance show favorable prospects for prominent mines. Mr. Knapp is highly pleased with his prospects and thinks it strange that the opportunities Esmeralda offers are not more generally taken advantage of.

Water Terms.

As there does not appear to be a clear understanding by most people of many of the terms used in connection with irrigation, the following, by Charles L. Stevenson, hydraulic engineer, defining the meaning of such expressions and giving the comparative values, is useful.

Irrigation water is measured generally by the cubic foot, by the gallon or by miners' inches. The "duty of water" means the area of land upon which a definite volume of water, applied during a given period, will successfully raise crops. Thus, the average duty in Utah of one cubic foot per second during a period of 120 days is 100 acres. One cubic foot per second is a "second foot." The "acre foot" is the equivalent of one acre covered one foot deep, or 43,560 cubic feet. The miners' inch is a variable quantity, depending upon the head above the one-inch orifice of discharge. It varies from

a four-inch head to a six-inch head, and is not a commendable unit of measure. Thus, there are fifty miners' inches to a cubic foot per second, California measurement, and about forty miners' inches, Colorado measurement. One cubic foot contains 7 1/2 United States gallons of 231 inches.

Cubic feet.—1 cubic foot per second equals 2 acre feet in 24 hours, 60 acre feet in 30 days, 180 acre feet in 3 months, 720 acre feet in 1 year, 7.5 gallons per second, 449 gallons per minute, 50 California inches, 38.4 Colorado inches.

California Inches.—100 California inches equals 4 acre feet in 24 hours, 1 acre foot in 6 hours, 120 acre feet in 30 days, 360 acre feet in 3 months, 1440 acre feet in 1 year, 15 gallons per second, 900 gallons per minute, 77 Colorado inches, 2 cubic feet per second.

Colorado Inches.—100 Colorado inches equals 5 1/2 acre feet in 24 hours, 1 acre foot in 4.2 hours, 155 acre feet in 1 month, 465 acre feet in 3 months, 1860 acre feet in 1 year, 19.50 gallons per second, 1170 gallons a minute, 2.6 cubic feet per second, 130 California inches.

Supreme Court Decision on Water Rights.

The Supreme Court has decided the case of Ely against Ferguson, in which the question of the right to appropriate water flowing from springs was involved.

The plaintiff, Benjamin Ely, sued Louisa Ferguson to obtain a perpetual injunction restraining her from obstructing the flow of water into a ditch constructed to convey the water into his land for domestic and irrigation purposes. The injunction was granted and the defendant appealed. The ditch was constructed in 1862 by a man named Jamison, and extended from the land of the plaintiff to that of the defendant. The lands referred to are in Lake county, and was then public land of the United States.

On the land now owned by the defendant there was a marsh of about four acres and on one side of it there were hills, near the base of which several springs flowed, carrying in the aggregate during the summer and fall months about 24 inches of water, measured under a four-inch pressure. These waters flowed into the marsh, and thence through a natural channel to and across the plaintiff's land on points higher than they would otherwise have reached.

In 1867, Jamison posted and had recorded a notice that he claimed for purposes of irrigation, all the water flowing from the different springs. In 1870, he sold his possession claim to the land now owned by defendant, and one-half of the water appropriated by him, to one Chambers, and reserved by his deed the other half of the water for use on the land now owned by the plaintiff, where he then lived. In 1872 he posted and caused to be recorded another notice of appropriation, in which he claimed one-half of the water flowing from the different springs, amounting to 12 inches under a four-inch pressure and the ditch already constructed.

Chambers sold his claim to R. R. Ferguson, the defendant's predecessor in interest, who obtained a U. S. patent for the land, subject to vested and water rights for mining, agricultural and other purposes. Jamison lived on the land now owned by the plaintiff and used the water until 1872, when he conveyed the land with its appurtenances to one White who obtained a patent therefor. White conveyed the land to one Getz, who conveyed it and all its appurtenances to the plaintiff in 1883. Each of these grantors and the plaintiff claimed and used one-half of the water flowing from the springs until 1887, when the defendant obstructed the ditch.

Two points were made for a reversal of the judgment. It was claimed that water flowing from springs could not be appropriated, and seemed that if Jamison did acquire a right to the use of the water of the springs and marsh, the land to which he conducted it was then unsurveyed public land to which he had no semblance of title, and hence the water right did not become appurtenant to the land, and could not be passed to another except by deed.

The Supreme Court held that neither of these claims could be upheld. Water flowing from springs, as this water did, may be appropriated, and the land to which the water was taken by Jamison did not prevent the water from becoming appurtenant thereto. For these reasons the judgment of the lower court was affirmed.

Jamison was a rightful occupant, as all public lands are open to occupation and settlement by citizens of the United States, and from the earliest times in this State it has been customary to divert water to public lands for mining, agricultural and other purposes, and this right was in 1866 confirmed and approved by Act of Congress. The Civil Code also makes provision fitting the case in Sec. 662.

The big engines of the Los Angeles Electric Railway Company's new power-house were started up for regular business September 16th, the inauguration having been delayed a couple of days. The great dynamo, of 250-horse power, was set going to generate the electricity required for propelling the cars now running on the line.

The new shaft engine was put in place at the Con Virginia mine Saturday, and a full force of miners set to work on the different levels. So says the Virginia Enterprise.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE.—*Ledger*, Sept. 26: There is no change to report in the condition of affairs at this mine. It has been tied up by attachments for over a year and there seems little prospect of a speedy settlement of the legal difficulties in which it is involved. There were some rumors circulated some time ago that an effort would be made by the English company to settle with the creditors at so much on the dollar. No proposition of the kind, however, has been made to the creditors around Jackson. The keeper, N. Millosovich, remains in charge of the property for the sheriff, and J. E. Dye continues at the mine as the representative of the English stockholders.

KEYSTONE.—This old mine—the longest-lived mining property in Amador county, if not in the State—has levied its first assessment of \$2.50 per share. The cause for this demand for money is the great improvements which are made about the mine, including the addition of an air compressor. Only a portion of the mill has been running for months, and on low-grade rock at that, and the output of bullion has not kept pace with the expenses. We understand there are only 10,000 shares in the company, all in the hands of a few individuals, so that the assessments will realize \$25,000. The outlook of the mine, however, promises fair for the inauguration of a new dividend-paying era in the near future.

MISCELLANEOUS.—Messrs. Mello and Arata have entered into an agreement to bond their mining claim at Jackson Gate to San Francisco parties for \$20,000. The bond is to be executed early next month. The two-stamp mill is running under the management of the owners. A cleanup was made last week, but we are unable to state the exact yield, although it is claimed to be satisfactory.

Butte.

QUARTZ MINING IN BUTTE.—*Oroville Register*, Sept. 26: This country has long been rich in quartz mines but the outlook for extensive quartz mining is now brighter than ever before. D. K. Perkins is opening a mine near Gravel Range. C. G. Ferguson is opening one near Enterprise; the Shakespear ledge is being developed and a mill will be built upon it shortly. The Stow mill is being enlarged. The mill on the Golden Queen will be increased in working capacity. The Lumpkin Co. is developing a fine property that promises to be rich and a mill will sooner or later be built. The Palo Alto Co. will have ten more stamps running in a few weeks. Rich rock has been struck by Messrs. Gray and Chivels near Hurleton. The mines under Major Reynolds near Merrimac Mills are paying finely while from every quarry comes cheering news of rich ore, new developments, increased milling capacity, or new mills or arrastras being put up. The improved facilities for working refractory or low-grade ores have given a wonderful stimulus to quartz mining in Butte and to-day that branch of our industries wears a brighter and more encouraging look than ever before in the history of the State.

ENTERPRISE.—From Mr. C. G. Ferguson of the Enterprise Mine Co. we obtain some facts concerning the mining operations on McCabe creek. Mr. Ferguson is superintendent of the mine there and tells us that two arrastras to be run by water power are being put in. Owing to the absence of any road the machinery is hauled to the top of the hill and then let down the deep inclination with ropes and pulleys. The arrastras will be run with water from McCabe creek and it is estimated that from four to six tons a day can be ground by each one. A Dodge rock breaker has been put in which prepares the rock for the arrastras. There are two veins, one about two and a half feet wide and the other fully 12 feet in width. There are three tunnels, one 100 feet long, a second 180 feet and a third 300 feet. This last one will strike the ledge fully 400 feet below the surface giving an enormous amount of rock, and Mr. Ferguson estimates that they have developed ore enough to last a 10-stamp mill for ten years. As soon as the rock is sufficiently tested a 10-stamp mill will be put up and this will be run by water power already named. Most of the stock of this company is owned in Chicago and it is the intention of the company to fully develop the mine before putting expensive machinery upon it. There is an abundance of timber for timbering the mine and other purposes and the water power affords a cheap method of running the arrastras and the mill.

THE GRAVEL CEMENT in the bottom of the Spring Valley mine at Cherokee after having been thoroughly cleaned of its gold by the company has been leased to other parties. They have been at work for some months past and have paid little more than expenses. Lately they have put in some new machinery for grinding or crushing this cement and the last run paid them well. There is enough of this cemented gravel to last for ten years' work.

HUNTING THE BLUE LEAD.—*Palermo Progress*, Sept. 26: G. Moore has gone over to the Honcut near Bangor where he will superintend the sinking of a shaft on a mining claim belonging to Streeter and Boulware, the big sheep raisers. Mr. Moore hopes to encounter the famous Blue Gravel Lead which has proved such a source of wealth to those who have been fortunate enough to own mines in the vicinity. If the claim gives indications of panning out well the owners will at once erect a mill for crushing the ore. Messrs. Streeter and Boulware are two wealthy farmers residing near Biggs. They have abundant means to prospect and work this mine. This town is interested in the success of Messrs. Streeter and Boulware as this place will be the shipping and trading point, as the mine is near here.

Colusa.

OIL WORKS.—*Williams Farmer*, Sept. 26: J. P. Rathbun informs us that he and his brother have effected the lease of the petroleum mine, that he discovered on Sulphur creek last winter, to the Union Oil Co. of California for a term of fifty years. The agent of the company was in Williams and left for San Francisco the same day, so we did not get a chance to interview him concerning the intentions of the company he represented, but from information furnished us by Mr. Rathbun, he seemed to

have great confidence in the ultimate result of the financial success of the company's lease and predicted for the mine a brilliant future. The intentions of the company are to erect works that are to cost \$1,000, within the year. If these oil springs come up to the expectations of the parties interested we may expect considerable benefit to accrue to Williams therefrom.

El Dorado.

JONES' HILL.—*Georgetown Gazette*, Sept. 24: The Hard Struggle Mining Co. have struck good prospects and are busy opening the old Orleans tunnel, which was run 40 years ago. Mr. Bentley is hauling timbers for his gravel mine, where he intends to begin work soon.

Inyo.

PROSPECTS GOOD FOR A LIVELY CAMP.—*Inyo Independent*, Sept. 26: It is highly probable that a rich mining property will be developed at Pine Mountain. S. P. Roberts has been located in that country for many years past and had located quite a number of claims. He is a poor man and unable to develop the property himself, but his faith that the mines would ultimately be developed was great, and he pluckily hung on. Some time ago Andrew Fyfe inspected the country, and the result was that he has bought Roberts' interest in the group with the exception of one mine, which the latter reserved. A good wagon-road has been completed up Black Canyon and a small mill erected at the mines. Dick Whittaker, who came in from there last Sunday, says the stamps will commence dropping tomorrow. D. J. Hessian is interested with Mr. Fyfe and has a team engaged in freighting. A carload of ore was shipped during the week. Some two years ago, at the invitation of Mr. Roberts, the editor of this paper visited the Pine Mountain country, and predicted that some day a good-paying camp would be located there.

FISH SPRINGS.—*Inyo Index* Sept. 26: Jack Welch's recent efforts in working by arrastra process the highly sulphuretted but rich gold ores of the old Fish Springs District were decidedly successful. He will continue work during the winter, there being no longer a doubt as to the "paying proposition" business.

MAZOURKA.—Oscar Stickney will do a lot more development work on his claim above and west of Badger Flat. Uncle Joe Groves has begun work on his mine near the forks of the canyon. This is one of the oldest locations in Union District, showing a broken body of silver lead ore that only requires close sorting or else a concentrating plant.

Nevada.

THE CENTENNIAL MINE.—*Grass Valley Telegraph*, Sept. 25: Supt. A. W. Stoddard is getting things in shape at the Centennial mine. The plant is about as good as any around here, being just large enough for the work required and having nothing cumbersome about it. The buildings are all up, the pumping engine is in place, and it will be but a few days when the hoisting engine will be ready to run. The collar of the shaft has been cleaned out and retimbered, and in about 15 days a force of men will be put to work on the Centennial. The present shaft at the mine is down to a depth of 600 feet, and the machinery is fully capable of working to a depth of 1000 feet.

Placer.

THE THREE STARS MINE.—*Herald*, Sept. 26: Mr. Wm. Werry, who has been engaged under B. F. Hartley in pumping out the Three Stars mine, was in town the early part of the week, and he informs us that the water is now being pumped from the lower level, which is 400 feet deep. He thinks this level will be drained free of water in a few days, after which he expects to commence sinking and drifting on the 400-foot level. Mr. Werry seems to think well of the mine and its future working. So far as can be seen, the vein is strong, being 2½ feet thick, with 20 to 25 dollar ore. The mine has a good record, but present appearances indicate that everything has been taken out to a depth of 400 feet on this chute of ore and milled. This vein can be traced on its outcroppings for miles in length, and there is no question about its being a true fissure vein or lode. Mr. Werry thinks it is the same vein as the Zentgraf mine, in El Dorado county. He thinks the future working will prove it to be a handsome paying property, and that Mr. Hartley has a better mine than he is aware of. This is certain, there is hardly a mine in the State that has yielded more gold at the same depth than the Three Stars. In predicting good future results, Mr. Werry ought to know what he is talking about, as he has had 20 years' experience in mines and mining in this locality, and has been, on the whole, as successful as any of them.

San Bernardino.

MINING GROUND LEASED.—*San Bernardino Times-Index*, Sept. 25: Mr. I. H. Crossman, the former superintendent of the Gavilan gold mine on the San Jacinto estate (limited), has acquired a ten years' lease of 4000 acres of land upon which the mines are located, and has commenced the organization of a stock company for the purpose of working the same. When the company is formed, work will be commenced on the mines. These mines were worked years ago by Mexicans, and large sums of money were mined there, and it is thought that with experience and new and improved machinery, more large fortunes may be made.

San Diego.

RICH AND MORE.—*Julian Sentinel*, Sept. 24: The phenomenal era of luck and prosperity that has followed our mines of late bids fair to continue until every mine in the camp has a treasure find to record. The first big strike brought to our notice since the magnificent ledge was cut in the Helvetia is from the Ruby which came to the front on Saturday last with a 16-inch vein of beautiful rock. Some of the specimens exhibited are actually encrusted with the bright yellow metal. The managers of the Ruby Company have been following good ore for some time, but the exceedingly rich rock now coming from their lower tunnel surpasses their expectations. Al Frary has been taking out good rock of late from the Eagle. We learn that the Kentuck S is soon to be started up under the management of a well organized company. This is a fine property, and had it not become involved in legal complications which compelled work upon it to be abandoned, we believe a great deal of money would now be coming from it. The High Peak has been temporarily shut down. The owner, Mr. Havermale, having for the time centered his forces and attention

upon the Helvetia. Before the High Peak is again operated, it is probable that machinery will be put in to handle the water more expeditiously. Visitors at Banner the past week have been forced to remark upon the activity presented there. The big mill of the Gold King Company has been kept company by the Kerr mill, and between the two, considerable rock has been crushed. James Courtney and Mike Flatley are at work on the Padlock mine. If they can fit the right key, they will surely unlock the treasure of the hills. Work on the now famous Helvetia is still progressing. We are informed that the men are now 40 feet from the point of first contact with the rich lead, and the character of the ore taken out is as good as the first strike. This find is great—it is immense. It is not excelled in quality or quantity by any mine in Southern California.

Shasta.

FROM IGO.—*Cor. Shasta Courier*, Sept. 26: J. P. Wright and sons are down 30 feet with the shaft on their newly discovered silver ledge. It is located just off the South Chicago grounds, and has been run over for years, a house being built close by in years past, the men passing over the ledge in going to and from work on an adjacent location. The ledge is now four feet, a foot of which nets \$100 per ton, shipped below. Two shifts are now at work sinking, the intention being to drift at 60 feet. D. Bull is working on a small vein on the grade between his house and Robinson's. The vein has been exposed for 20 years or more, the county road cutting it. Though small, the ore is nearly all pay, and nets \$11 per sack. A shipment has been made from the Crystal, the returns from which have not been received at this date. There is no doubt about the ore being good. The crosscut for the main ledge is more than half completed. Robinson & Son have found a vein of high-grade ore on or near their Black Prince. The ore is said to go over 1000 ounces per ton. A tunnel is being run to strike it some distance from the surface. Report has it that the Eubanks boys have also found a good ledge of silver ore. Jones of Muletown has one of his patent arrastras set up at Robinson's, and is running some ore from Streeter's ledge. The arrastra is about two feet in diameter, with 2½ tons' capacity. Shirland's arrastra is running on ore from the Creighton ledge. E. L. Ballou is running his arrastra on Manzanita ore. Litten and Moody have their arrastra rebuilt, and are grinding Continental ore. A good many of the ledges here are small, but no one has yet found the bottom of one, or been able to dig out all the ore.

Sierra.

SIERRA CITY.—*Cor. Mt. Messenger*, Sept. 26: Times are seemingly rather dull just now hereabouts, but the prospect is very bright of an early revival in mining interests and a change for the better, when more mills are crushing the gold from the partially developed rich ledges in this auriferous mineral belt—the most extensive in this county. Raise from No. 4 to 3 tunnel, at the Young America quartz mine, progresses satisfactorily—up 250 feet last week. New Phoenix mill will be completed to crush ore by Oct. 15th. A. C. Busch, owner of this valuable property, is very much pleased with the certainty of handsome dividends the snow flies. Encouraging prospects are being obtained from adjacent quartz mines that may soon afford work for more men.

MOUNTAINEER.—*Mt. Messenger*, Sept. 26: We understand that the affairs of the Mountaineer mine have been straightened out since the arrival of Mr. Winter, and work will be renewed at an early day.

Slaskiyou

GRAVEL.—*Yreka Journal*, Sept. 26: Lee, Lash & Co., have finished their shaft to sufficient depth for drainage and are now drifting toward the pay gravel which they expect to reach soon, and commence getting out gold again. Myron Carrick has found a very rich ledge of decomposed quartz on Greenhorn, next above the Hookthorn & Clark ledge, and is now busily engaged in opening it, so as to develop its extent. The workers in the Spencer mine, at Humburg, are sinking down deeper in developing the ledge and getting ready for winter operations in taking out quartz. Considerable quartz will probably be crushed before the winter storms commence, as the mill is now kept running constantly. The shaft in the Yreka Blue Gravel claim is down about 108 feet from the surface, with an improved appearance of the gravel, now yielding some gold, an indication of nearing bedrock, where it is anticipated the gravel will pay handsomely. F. Franklin, of Greenhorn, has found an exceedingly rich body of quartz on the north fork of Greenhorn, which if proving extensive, will be one of the richest quartz claims yet discovered in this county. Mr. Franklin has been prospecting for many years on Greenhorn, and understands mining very thoroughly. This new find is in the vicinity of the claims of Ira Worden, Heckathorn & Clark and others, in which good prospects have also been found. The Chinese working the Bentz Bar claim, near Honolulu, at Klamath river, are reported to be taking out immense quantities of gold dust from bottoming up the cuts opened in the old river channel. Rumor says they lately realized \$21,000 in three days run, but we are unable to confirm this report, as the Chinese are mum, except in admitting that the claim is now paying. This company works a large force day and night, and the claim is in a good locality for rich pay, judging from the extensive yield of the old Kanaka claim in the same vicinity, some years ago. The Phil Mott claim, below Honolulu, on Klamath river, is also said to pay well, ranging from 50 to 100 ounces a week in bottoming cuts at bedrock. The Beebe Bar claim, owned and kept in operation by J. S. Cleland, our well known and enterprising Yreka merchant, paid between \$600 and \$700 in one day's clean up last week, with prospects of better yield in uncovering bedrock as the work is continued up stream. An immense amount of gold is coming to Yreka from the Klamath river placer mines and the Humburg creek quartz mines, the persons bringing it taking great care to avoid being waylaid. It is brought here in various ways to avoid suspicion, and notwithstanding the great amount of bullion transported every year from the sections above named, we have never yet heard of any highwaymen molesting the parties carrying the gold.

Tuolumna.

THE BADGER MINE.—*Independent*, Sept. 26: Geo. Stayton and others have instituted proceedings to dispose of John Sevenoaks from any possession he might claim in the Badger mine. The Badger mine,

the property of W. G. Martin and Henry Yancey, was bonded some time ago to Gilroy capitalists, represented by Geo. Stayton, for \$8000. Subsequently the mine was re-bonded by the Gilroy company to W. H. Martin and John Ballard of San Francisco, for \$25,000. John Sevenoaks was sent up to superintend the development of the mine, with the agreement that he should have a tenth interest in the profits of the mine. Operations were commenced and continued about two months, incurring an indebtedness of about \$5000. The mine proved satisfactory, but not so Superintendent Sevenoaks. A short time ago, W. H. Martin came up from the city, suspended operations on the mine and shut it down. He also discharged the superintendent and paid all the bills; but notwithstanding all this, Sevenoaks continued in possession, still working the mine and ignoring every one else, claiming that he would continue to operate the mine, but this story did not satisfy the interested ones, who have brought suit to oust him.

NEVADA.

Washoe District.

CON. CAL. AND VA. MINE.—*Virginia Chronicle*, Sept. 26: 11000—Have continued retimbering south drift. In the crosscut running east from the shaft station have been easing timbers and making necessary repairs. At a point in the south drift, 100 feet from the south station, a west crosscut has been started and advanced 8 feet. Have continued to extract some ore from the openings on the 1300 and 1600 levels. 1750 level—In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. At a point from the west crosscut 60 feet in the upraise has been carried up 23 feet in porphyry and vein matter of low assay value. From the crosscut running east from the winze No. 1, at a point 50 feet below the sill floor of this level, at a point 85 feet east from the winze, a north drift has been started and advanced 15 feet in quartz formation of low assay value. The northeast drift started last week in a narrow streak of ore, at a point 185 feet in from the winze, has been advanced 17 feet and work suspended. The streak is still showing in the top portion of the face. There has been extracting from all parts of the mine during the week 978-1280 2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all of the ore worked at that mill during the week (980 tons) was \$9.45 per ton. Bullion shipped to Carson Mint; assay value about \$25,000.

OPHIR.—1465 level—We have continued our prospecting work from the openings in the vicinity of the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level.

MEXICAN.—On the 1465 level the south drift started from the east crosscut No. 1, at a point 618 feet in from the main north lateral drift, has been advanced 25 feet; total length, 319 feet; and continues in a hard porphyry formation.

UNION CON.—From the east crosscut No. 2 on the 1465 level, at a point 1070 feet in from the main north lateral drift, the north drift No. 2 has been advanced 24 feet; total length, 95 feet in vein porphyry, which carries a low assay value.

CHOLLAR.—The east crosscut on the south line, 1200 level, is out 30 feet; face in porphyry. The south lateral drift from the incline station, 1500-foot level, is out 104 feet; face in porphyry. Extracted and sent to the mill during the past week 416 tons of ore; average battery assays, \$15.66.

POTOSI.—The east crosscut on north line, 1200 level, is out 30 feet, face in porphyry. South drift from winze station, 1400 level, is out 74 feet; face in porphyry. The north drift, same level, is out 73 feet; face in porphyry and streaks of quartz yielding low assays.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—We are progressing rapidly in handling the water. We are now below the upper drift and will continue on the lower one, which we expect to reach in a few days.

ANDES.—On the 420 level, main north drift was advanced 20 feet; formation clay and porphyry. East crosscut No. 4 from north drift extended 19 feet, continuing in quartz, yielding low assays.

SIERRA NEVADA.—West crosscut No. 1 from the northwest drift, 630 level, 571 feet from the shaft, has been advanced 46 feet; total distance, 1049 feet; formation, quartzite with small streaks of quartz of low assay value. The Kenosha tunnel has been advanced 30 feet; total length, 928 feet; face in hard porphyry.

CON. NEW YORK.—The west crosscut, 230 feet north of shaft, 650 level, is out 67 feet. It has passed through 8 feet of quartz, some of which yields fair assays. The east crosscut, 600 feet north of shaft, 1100 level, is out 33 feet. It has passed through 28 feet of low-grade quartz.

UNION SHAFT.—The west drift from the shaft, 900 level, has been advanced during the past week 24 feet; total distance west of shaft, 1104 feet; face in porphyry with considerable water.

EXCHEQUER.—Are still retimbering the shaft. The joint southwest drift from the 1800 level, Ward shaft, is out 402 feet; face in hard porphyry.

SILVER HILL.—The northwest drift, 50 level, is out from the shaft 270 feet; the face is in porphyry. The south crosscut, 160 level, is out from the winze 720 feet; face in hard porphyry.

UTAH.—The southeast drift, 725 level, has been extended 38 feet, total length 375 feet, continuing in porphyry showing a little clay.

OCCIDENTAL.—Have extracted and sent to the mill from all parts of the mine 905 tons of ore of the average value of \$16.20 per ton, as per battery samples. The upraise from the 650 level is up 27 feet, top showing \$16 ore. Have started an east crosscut from the end of the south drift on 725 level. It is now in eight feet in quartz, showing little value.

BULLION.—The joint east crosscut on the north line, 1300 level, is out 120 feet; face in clay and porphyry. The joint south lateral drift from the Potosi winze station, 1400 level, is out 74 feet; face in porphyry. The joint southwest drift from the Ward shaft, 7800 level, is out 402 feet; face in porphyry.

Robinson District.

ACTIVE.—*Eureka Sentinel*, Sept. 26: From Mr. Cupid, Auditor and Recorder of White Pine county, who is at present visiting Eureka on mining matters, we learn that considerable activity prevails in Robinson district. Mr. Watson is working six men un-

der the charge of Gum Peters, and every stroke of the pick continues to show up its great wealth. A well-defined streak of \$30 gold ore has recently been developed in the southeastern portion of that mine, where formerly little of value was thought to exist. The Florida, Joanna No. 2, Rob Roy, Chairman and a number of other good mines in the district exhibit additional value as development is made. Mr. Cupid is confident that Robinson is destined to become the Comstock of the Great East, so soon as the suicidal litigation is ended, which has up to this time retarded its great worth. He says the Chairman mine alone is admitted to have more than \$150,000 of gold ore in sight.

Eureka District.

CLEANUP.—Eureka Sentinel, Sept. 26: The Eureka Con. Company made a cleanup of ore at their mine last Saturday, which was intended to be the last to be worked at present at their furnaces. It pays the company to ship their low-grade iron and lead ores to Salt Lake.

LAID OFF.—A number of miners having been laid off in the Richmond, Eureka Con. and Williamsburg mines, has caused some of them to look for "pitches" in other localities.

Pine Nut District.

RICH ROCK.—Eureka Sentinel, Sept. 26: It is reported that Z. R. and Schultz have resumed work on their mine at Pine Nut, and are taking out the same immensely rich rock. Men have been put to work in other parts of the camp.

OREGON.

A BIG INSTITUTE.—Eugene Register, Sept. 26: The Myrtle Creek Mining Company is of more benefit to Eugene than many people imagine. One hundred and sixty men are now employed at the mine, and most of them were sent out from Eugene. The pay-roll is about \$5000 per month. In addition to this, the men are fed by the company, and \$1000 or over are paid out every month for food and supplies, nearly all of which is shipped from Eugene. About four miles of ditch remain to be dug before the head waters of the Umpqua will be tapped, and this will probably be completed next month.

THE WILLOW CREEK MINES.—Heppner Gazette, Sept. 26: In conversation with Mr. Scott, who is developing the Little Laura at the head of Willow creek, we learn that work is progressing quite rapidly, and that some time next spring they will tap the main ledge, which as rich as croppings suggest, will prove a bonanza. There is but little being said about this district, but blowing doesn't always make mines.

MORROW'S OPAL MINES.—It was our pleasure last week to see some beautiful opals from the Hoskins-Hadley claim. They were taken from the g-bone formation, and present a most attractive appearance. Mr. Hoskins informs us that they have thoroughly developed their claim and have every reason to believe that they have a good thing. Morrow county's opal mines are attracting considerable attention from every quarter.

WASHINGTON.

TO HYDRAULIC.—Seattle Press-Times, Sept. 23: Miners and sportsmen are likely to engage in a spirited legal contest next season. The hydraulic process will be used in the placer mines along the Sultan, Swank and Ruby creeks. Hydraulic mining means death to the fish that are below in the stream and it is thought that some of the numerous rod and gun clubs will ask the Fish Commissioner to interfere. It is also feared that the State Legislature may interfere with the use of the hydraulic process. The Ruby, Swank and Sultan could hardly be classed as navigable streams. Miners say that state legislation against the hydraulic process would be a great injustice, as the reasons which caused the law to be passed in California do not exist here. The Washington streams have high banks, and there is very little farming land lying along the banks. Some placer diggings, which it does not pay to work by the old sluice process, pay large dividends when operated by the hydraulic process, and the justice of the California State law is severely criticised by mining men. The fact that hostile legislation is feared is said to be the reason that a company, alleged to be composed of Boston men, has not given any publicity to the fact that it will put in a number of hydraulic machines on the Swank, Ruby and Sultan. The name of this company is not known, but owners of placer mines along these creeks have been heard to declare that the sluice would be abandoned next season for the hydraulic process. There is but little doubt but that the hydraulic process will pay along these streams, as at present, many miners are earning fair wages by the use of the sluice. It is said, however, that if operations are interrupted by legislation or the Fish Commissioners, it will be a very unprofitable investment, as hydraulic process is very expensive, and if its use is prohibited in this State, there will be no place where the machinery can be used, as the placer fields of British Columbia, as a rule, do not require its use.

PORTLAND EXPOSITION.—Mr. G. W. Ingalls, of Portland, Oregon, has been for some weeks in charge of the mineral and natural history department of the Oregon Immigration Board and the Industrial Exposition, and has been east of the Cascades for some time engaged in the work. He writes us from Portland that the crowds at the Exposition are increasing daily. The general opinion is that the exhibits are the best ever seen in Portland.

AFTER paying all bills for August account, the Consolidated California and Virginia Mining Company had a surplus of \$126,000, against about \$150,000 after paying the previous month's expenses. The decrease was caused by the small haulage product of the mines and the fact that the company had to pay the quarterly haulage tax, amounting to \$10,500.

THE ARIZONA UNIVERSITY opened this week. The School of Mines and the Agricultural College opened at the same time with the same faculty. Professor A. A. Guiley is Dean and Dr. Theodore B. Comstock, Director of the School of Mines.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING, Sept. 22, 1891.

- 459,885.—AUXILIARY SAFETY SPRING.—Wm. M. Betts, S. F.
- 459,923.—NETTED WIRE FABRIC MACHINE.—T. M. Conner, Los Angeles, Cal.
- 459,887.—HARNES.—H. G. Cox, Alvarado, Cal.
- 459,837.—PIANO-MUTE.—Frederick and Gelsler, Portland, Or.
- 459,751.—COMPOUND FOR SHIPS' BOTTOMS, ETC.—B. Hooker, San Diego, Cal.
- 460,020.—PLOW.—C. W. Larsen, Medical Lake, Wash.
- 459,917.—CONTACT FOR ELECTRIC PROGRAMME CLOCKS.—F. E. Smith, San Jose, Cal.
- 459,885.—ENGINE.—Thibault & Harsin, Stockton, Cal.

The following brief list by telegraph, for Sept. 21, will appear more complete on receipt of mail advices: California.—Walter B. Hildner, water motor; Matthias Melittzer, hat-pressing machine; Carl L. Schallitz, still; James M. Dyer, wave-power; Richard Wheeler, insecticide; Gustav Gunnarson, three-griped self-adjusting pipe wrench; Samuel N. Goldy, wood-turning lathe; Clayton P. Smith, pump—all of the above being of San Francisco. Ellsworth D. Middlekauff, Stockton electric grinder; Henry Kohrer, Stockton, vehicle wheel; W. Conrad and J. H. Lake, Hanford, windmill; Wm. W. McGregory, Pasadena, reamer; Jerry Cook, Monterey, building blocks; Wm. J. Burke, Seattle, r. steeling light; Moses Laussen, Goldendale, Wash., car coupling.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AUXILIARY SAFETY-SPRING.—Wm. M. Betts, S. F. No. 459,886. Dated Sept. 22, 1891. This auxiliary safety-spring consists essentially in a supplemental spring to be used in connection with vehicle springs to prevent damage to the latter from overloading. The safety-spring is placed on the upper side of the lower half of the ordinary elliptic carriage spring. It is made straight or slightly concave on the top and has curved ends so that it returns upon itself, the curvature of the ends forming an arc. The inner ends of the spring are curved to the segment of a circle, so that the upper ends of these segments, which are near together, will stand a short distance beneath the upper surface of this supplemental spring. On the under side of the upper half of the elliptic spring is a block or bumper, which, when the main springs are overloaded, comes down and meets the auxiliary safety-spring, preventing the two pairs of the main spring from being closed any nearer together.

HARNES.—Harris G. Cox, Alvarado, Alameda Co. No. 459,887. Dated Sept. 22, 1891. In the ordinary construction of driving harness, a collar or breast-plate is employed, to which the traces are connected, and both of these devices are objectionable because they interfere with the free movement of the horse's shoulders. This is especially the case in track-work, where it is desirable to give the horse the freest possible movement in order to increase the stride and the speed at which he can travel. In this invention both these devices are dispensed with and the horse's shoulders and front part of his body are left entirely unimpeded.

ENGINE.—Henry Thibault and Chas. D. Harsin, Stockton, assignors of part to John Gambetta, same place. No. 459,885. Dated Sept. 22, 1891. This invention relates to certain improvements in engines to be propelled by steam, air, vapor or any other elastic or suitable medium. It consists in the arrangement of two or more cylinders within a rotating rim and radial to the center thereof, pistons reciprocating in said cylinders, and connecting rods uniting said pistons with a stationary pin, which is eccentric to the center of the rim to which the cylinders are fixed.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb. @	13 1/2	English, lb. @	16 @ 20
Refined, in car lots @	8	Black Diamond tool @	9 @ 9
Powdered, do. @	8	Pick & Hammer @	8 @ 10
Concentrated, do. @	7 1/2	Machinery @	4 @ 6
All grades jobbing at advance.		Toe Chalk @	4 @ 5
COPPER.		TINPLATE.	
Bolt @	22 @	B. V. steel grade	
Sheeting @	22 @	14x20, spot @	7 00 @
Ingot, jobbing @	15	Pharmacol, 14x20, 7 00 @	
Do, wholesale @	14	Do roofing, 14x20, 5 50 @	
Fire Box Sheet @	22 @	Do, do, 20x25, 13 00 @	
IRON.		Pig tin, spot, @	13
Bar, base @	31	Irreg. lat. nom. @	24 1/2
Round, base @	30 1/2	COAL.	
THE IRON SHIP.		Spec. Low SPOT FROM AUST. PER TON.	
Eglinton 3 ton @	24 00	Wellington @	89 00
Glenarmon 3 ton @	27 00	Greta @	8 00
Ann. Soft, No. 1, 28 50		Charbon Hill @	8 00
Oregon Pig @	25 00	Nassau @	9 00
Pugot Sound @	27 00	Robt. Gilman @	7 00
Clay Lane White @	23 00	Seattle @	7 00
Shotts, No. 1 @	22 00	Coos Bay @	6 00
Langdon @	25 00	Channel @	9 50
Thorncliffe @	25 00	Egg. hard @	14 00
Gartsherrie @	26 00	Cumberland, in sacks @	14 00
Barrow @	26 00	Do, bulk @	13 00
Garroch Pig @	23 00	Walt end @	9 00
CHEMICAL IRON ORE.		West Hartley @	8 51
Pertona @	10 00 @	Brynbo @	8 51
LEAD.		West Hartley @	8 00
Pig @	41 @	TO LOAD PER TON.	
Sheet @	51 @	Anstaltan @	87 00 @
Hoe @	74 @	Liverpool St. am. @	7 00
Pipe @	63 @	Scotch Splint @	7 00
SHORT.		Cardiff @	7 25
(Discount 100, on 50 bag.)		Lehigh Lump @	13 00
Dron, 30 bag @	1 90 @	Cumberland @	10 00 @
Buck, 30 bag @	2 10 @	Egg. hard @	14 00
Chilled, 40 @	2 30 @	West Hartley @	7 50
BY THE TON.		English, to load @	89 00 @ 11 00
Flasks, old @	40 @ 50	Do, spot, in bulk @	12 00

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 1, 1891.

General trade continues to improve. Merchants are said to be getting into better position, financially, than for several years. Among iron-workers continued activity in all branches is reported. Some report too much work. The money market is easy. The many who claimed that tax-collecting would be severely felt, now say that it will hardly create a ripple, for tax-payers are prepared to meet the payments.

MEXICAN DOLLARS.—The market is quiet at around 77 cts.

QUICKSILVER.—There is a fair call, with sales made at quotations. Receipts, the past week aggregate 103 flasks.

SILVER.—With the surplus stock in this country being reduced to very small proportions, and the output of the mines not meeting current requirements and the market going down, it is something of a puzzle even to those who try to keep well-informed on silver. India continues to draw heavily from England, yet the effect is, as yet, transient. Probably the present condition of the market is largely due to the desire of European Governments to secure all the gold that can be had without a too great disturbance in the money centers. To this can be reasonably added, as an unfavorable influence, the feeling of unrest and feverish uncertainty which pervades, at present, all classes in Europe. To an outsider, it looks as if European nations stood over a powder magazine which, at any time, is liable to be set off by a stray spark. Times abroad are very critical, and until more amicable feelings are cultivated, a general war is likely to be brought about by imprudent or incautious remarks or acts from those in authority. Yet when nations are prepared for war, it seldom comes.

BORAX.—The market is steady with continued free shipments to the East.

LIME.—Receipts the past week aggregate 3739 bbls. Notwithstanding that the low price of imported cement has lessened the use of lime in building work, there is a free demand at current quotations.

TIN.—The market is essentially unchanged for both plate and pig. Receipts the past week aggregate 700 boxes, overland, during the past week. A cablegram under date of London of Sept. 23: "Pig tin prices improved under the influence of Straits shipments being smaller than expected. The latter circumstance prompted some buying for 'loog' as well as covering of 'short' sales. The consumption continues good. During the past few days speculation has fallen off in the absence of encouragement from the leading operators." The Iron Age reports the New York market quiet but steady under firm holding.

COPPER.—The market is steady at unchanged quotations. New York mail advices report as follows: Home consumers are consuming more copper at present than at any previous time this year, the late break in prices for manufactured copper and brass having drawn in numerous orders from various sections. Export movement has served to cut surplus stocks considerably, also leaving producers well in control. Arizona ingot, of which there is only a moderate supply available, is quoted at 12c to 12 1/2c. Casting bars remain at 11 1/2c to 11 3/4c, without movement of important volume the past week. The official report of the Bureau of Statistics gives the following data of exports from the United States during the seven months ending July 31:

Ore, tons	1891.	1890.
Ingot, bars and old, pounds.....	39,724,311	7,312,648

IRON.—Imports the past week aggregate 100 tons from New York. Large buying orders can be placed at concessions on asking rates. The consumption is steadily increasing.

LEAD.—The market continues to maintain a firm tone in sympathy with the East, where a freer movement is reported. The demand is said to be legitimate business.

COAL.—Imports the past week aggregate as follows: From Tacoma, 10,150 tons; Liverpool, 2310; Sydney, 1635; Swansea, 2200; Newcastle, N. S. W., 1906; Seattle, 4400; Tacoma, 7000. Total, 29,341 tons. The market for spot and nearby foreign cargoes is barely steady, but for shipment it is firm with ships disposed to ask more freight. The large tonnage on the way to this port for wheat loading has caused outward charters to recede which naturally reacts against cheap coal freights. The imports of coast coals the past week were very heavy, with free shipments on the way.

Eastern Metal Markets.

By Telegraph.

New York, October 1.—The following are the closing prices the past week:

Silver in London.	New York.	Copper.	Lead.	Tin.
Thursday @	97 1/2	12 40	4 52 1/2	90 10
Friday @	97 1/2	12 35	4 52 1/2	20 10
Saturday @	98	12 35	4 55	20 10
Monday @	97 1/2	12 35	4 55	20 10
Tuesday @	97 1/2	12 35	4 52 1/2	20 00
Wednesday @	97 1/2	12 25	4 50	20 00

Quicksilver is very strong. Borax is steady and firm. Lead is firmly held. Copper has weakened slightly. Tin is in moderate demand.

DUTY ON FOREIGN BOOKS.—The Treasury Department, in reply to a letter of inquiry from J. O. Powell, librarian of the University of California at Berkeley, decides that the importation of notable books by mail is prohibited by article two of the universal postal union convention; but as books imported—not more than two copies in any one lot—in good faith, for the use of any society incorporated for philosophical, literary or religious purposes, or for the encouragement of the fine arts, or for the honor by order of any college, academy, school or seminary of learning in the United States, are exempt from duty, such prohibition does not apply to them.

Mining Share Market.

Mining shares the past week, were very dull and heavy, necessitating the pool to cross-orders so as to make lower quotations, and draw in actual sellers. The market, if it can be dignified by the name, has every appearance of a genuine freeze out of the limited few who still hold stocks. Persons who are supposed to be close to the inside have repeatedly stated that before a big market, the public would have little or no stock. If their assertions were authorized, then we ought reasonably to look for a big market being near at hand, for never within the history of the Comstock mines, has the public held so few stocks as they do at the present time. Commission brokers hold very few on a margin, while hundreds of persons who formerly held lines of cash stock, now have either none or else very few. Not only are they without stocks, but it is quite certain they will not enter the market as buyers until there is a change for the better in milling the ores extracted. It would seem, unless the pool wishes to confirm the public in the opinion that the mines are being looted, the mine managers would conform to the mining laws of this State, and give detailed statements regarding the work being done in the mines; and give the mine and car sample assays as well as battery assays. When this is done then mined men, who have dealt in stocks will come in, but until this change is made these men will fight shy of the game that gives to insiders the bullion, and outsiders the assessments. Notwithstanding the difficulty of drawing more mined men into their trap, the writer still believes that the pool will through cross-orders quote prices considerably higher before the end of the year, and to induce buying there will be circulated bull information from the mine, doctored to suit the pool's purposes. That legitimate bull information can be and will be given out, does not admit of a doubt, for the ore to do it on is in several of the mines. Before inaugurating, a big up move the market will probably be manipulated as it has been for some weeks past, with possibly still lower quotations and more assessments, so as to get about all of the few remaining stocks still out.

In 1880, the year when Con. Virginia went from about \$2 to over \$50, and Ophir from 35 cents to \$35, railroad securities at the East and in England were dull and very low up to well into the summer months, but in August they began to rally and a big boom set in in the month of September. This year railroad securities at the East and abroad were dull and very low up to about August, when a bull campaign set in and prices in last month (September) made quite a decided up move with still higher prices looked for. With a bull campaign in railroad securities and grain, the mining share pool can and doubtless will make a bull move in their securities, as was done in 1886. To that year it was the shorts aided them, while this year it will probably be on bull information from the mines.

Referring to the west ledge, the Virginia Chronicle in its issue on April 16, 1889, said: "The surface croppings west of the main Comstock lode indicate the presence of several large veins, which have been cut through in driving adit tunnels, which penetrated those veins at a few hundred feet below the surface, and they showed marked improvement at that depth. A large amount of bullion was realized from ore extracted in driving the Cole tunnel, which has a length of 2000 feet and cut through a solid body of highly mineralized quartz nearly 100 feet in breadth. The theory that nothing but a soft wall of syenite lies behind the footwall of the main Comstock lode has long been proved fallacious, as was also the theory that beyond the east clay of what was heretofore considered the hanging-wall of the main lode, search for ore would prove futile. Several important ore developments have been made in Con. Cal. & Va., and one in Hale & Norcross in the past two years beyond what was formerly considered the east clay of the hanging-wall of the main lode." The ore mentioned in the above extract has not been taken out. Coming down to a later date, we find an article in the Virginia Enterprise, August 21, 1891, regarding work in Con. Virginia, from which we learn that the south lateral drift on the 1100 level, which was run from the shaft into ore at the top of a raise from the 1300 level, well toward the south end of the claims, made a connection with a north lateral drift from the Best & Belcher, which gives them good air to prospect that level by crosscuts from the shaft to the south lode. Well-informed miners say that a connection will be made on the 1100 level with the Ophir to the north, and crosscuts run at intervals for its entire length, and then they "will stop upward by degrees until the 800 level is reached, repeating the operation of drifting laterally and crosscutting at the intermediate levels from the Best & Belcher to the Ophir. It will be remembered that a few years ago the Central tunnel, which starts on Mill street, immediately opposite the Ophir shaft to the south, was run 1500 feet to the ledge; that a fire occurred in the tunnel, and that work was then stopped after putting in a strong bulkhead. The formation to be followed in the work of exploration upward from the 1100 level leads to the ore found in the Central tunnel. The Rowe ore strike of many years ago is also a continuation of the same formation.

News from the Comstock mines report that in Con. Virginia on the 1800 level the drift is in low-grade ore, but miners affirm that the work is done in such a manner as to leave the rich ore to the west for future extraction. A west drift on the 1100 level is being run to tap the west ledge in its downward continuation from the 800 level. The ore is very high grade. The other work to the mine is of a development nature. In Ophir, Mexico, Union and Sierra Nevada, the work gains in importance as it progresses. In Hale & Norcross and Savage, rich ore is being uncovered and ready for extraction, but for whose benefit remains to be seen. The work in these two mines is more extensive than has been made public for several years. The work going on from Ward shaft is attracting considerable attention as it pushes to the west. Good news ought to soon come to hand from some of the Gold Hill mines.

From the Quijota, Tuscarora and Bodie districts, the news is of increasing importance, particularly from the Bodie, although insiders are discouraging buying by quoting the stock down. Well-informed miners say that very rich ore, and in quantity, is being taken out of Bodie. Of course, assessments are levied so as to get outsiders to sell and not buy.

SCIENTIFIC PROGRESS.

The Science of Animal Locomotion.

Mr. Edward Maybridge, formerly of San Francisco, and the artist who made the first attempt, at Stanford's stable, to photograph animals in motion, is now in Paris. He recently lectured at the Rooms of the Paris Geographical Society on the "Science of Animal Locomotion in Relation to Design in Art." Mr. Bartholdi presided, assisted by Prof. Elwall, and the Hall of the Society was filled with a brilliant audience, which included a large number of the most distinguished artists in Paris.

The lecture says the *American Register*, of Paris, was profusely illustrated with the results of an electro-photographic investigation of the consecutive phases of animal movements, executed under the auspices of the University of Pennsylvania, for the purpose of setting at rest at once and for all time to come the apparently never-ending controversy as to the manner in which an animal uses its limbs while executing the commonplace functions of locomotion.

For the purpose of enabling the audience to more thoroughly understand the scientific character of the investigation, and the care with which all its details have been conducted, there was first projected on the screen diagrams of the studio at the University of Pennsylvania, and the batteries of cameras, electro-exposers, chronographs and other apparatus; and the method was described of obtaining a dozen or more successive photographs at regulated intervals of time, simultaneously from three points of view.

A long series of illustrations followed, showing the consecutive phases of motion of the horse while walking, trotting, cantering, galloping, leaping, etc., and corollary phases, incidental to the same movements, by the buffalo, lion, elephant, and many other cloven and soft-footed animals; of the cloth while suspended by the claws; of the child while crawling on the ground; and of man when walking with swinging arms. After the facts had been shown by analysis, a synthesis of each respective movement was demonstrated by the zoopraxiscope; and this was so perfectly rendered, that the individual peculiarities of different horses could be easily detected. After the syntheses there were shown the various quadrupedal movements, as interpreted by those artists of accurate observation—the cave dwellers—who came no one knows from whence; who existed no one knows when; and who have gone no one knows whither; but some of the descendants of whom are probably handling the brush and using the chisel at the present day. These were followed by an exhibition of some of the artistic products of the Egyptians, Assyrians, Phœnicians, Etruscans, Greeks, Romans, Byzantines; the statue of Marcus Aurelius at Rome, the great source of modern error in the conventional representation of the quadrupedal walk; and illustrations by Albrecht Dürer, Verrocchio, Meisner, Paul Delarocque, Hans Makart, Rosa Bonheur, Schreyer, and many other eminent artists of mediæval, and of modern times.

The lecturer was unreserved in his condemnation of those artists who in their representations of the gallop use the fashionable conventional phase, which no artist ever saw. He contended that the first duty the artist owes to himself in his representation of animal motion, is to study the facts of nature, before going to her for his impressions, and when the facts have been acquired, he will be surprised how different his impression will be from that which he formed, when in ignorance of them.

No artist, who had ever properly studied the facts of nature, would for a moment think of putting the foot of a horse a full metre beyond his nose farther than the horse could himself possibly place his foot; or represent three yoke of oxen dragging a plough by six different methods of walking, when nature confines an animal to one method alone.

After the illustrations of quadrupedal movements, came a splendid series illustrating the flight of a bird, the independent action of the primary feathers was clearly shown, by several consecutive phases of the wing of a cockatoo during flight, and a synthesis of the analytical series of a vulture was represented by the zoopraxiscope.

The lecture was listened to with marked attention by the audience, the applause was hearty in the extreme, for all felt a new era was open to the artist, in his being afforded the opportunity of combining truth with earnestness and vigor in his representation of active motion.

ETHER IN SPACE.—Prof. Nipher read a very interesting paper at the late meeting of the American Association of Science on the "Functions and Nature of the Ether of Space." It was once taught, said the professor, that light was an electric pulsation in an incompressible medium. Then the theory found favor that it was an electrical displacement at right angles to its line of propagation. Then the ætætic and electric theories were ingeniously put on the same logical basis by suggesting for the former a rigidity zero for the compression wave—an audacious idea that created pleased surprise. Light in matter must be either more dense or less ætætic than that in free space. Ether at the earth's surface moves with it, being dragged along as if it were a vivid liquid. Ether in

water seems to be condensed to 9-16 of its volume in air. Yet after all the fine theories and beautiful experiments, it remains an open question whether ether or any part of it is at rest in space, or whether it sweeps through the interior of hodie as the wind sweeps through the leaves and branches of a tree.

HERBERT SPENCER ON LIBRARIES AND SCHOOLS.—Notwithstanding the high position which Mr. Herbert Spencer has justly attained in the walks of science and literature, he nevertheless holds to some ideas which must appear very antiquated to the American mind, especially. His writings show him to be a very determined opponent of both public education and public libraries. These two systems, which are regarded in this country as almost indispensable needs in well-ordered communities, Mr. Spencer considers to be actual invasions on the rights of citizens. Indeed he can find no words too strong in denunciation of a system under which A must pay toward the education of the children of B, as he expresses it in "grammar and gospel about things;" while the public library is set down as simply a device for gratifying C at the expense of D. Mr. Spencer once paid a visit to this country; but he seems to have taken little trouble to study the beneficial workings of our institutions. Whatever may be his manner of handling many of the great questions in relation to human life and science; his mode of discussing the conditions and growth of human society are anything but felicitous, or calculated to promote its healthy advance.

DISTRIBUTION OF GASES.—The relative density or heaviness of a gas has practically nothing to do with its distribution. The heaviest and the lightest gases are found on mountain tops and in the deep valleys in the same proportions. The foul gases from our lungs, from gas jets, candles and lamps, are generally denser than pure air at the same temperature, but they soon distribute equally high and low. An adult person ventilates ten cubic feet of air per minute. A lamp or gas jet fouls as much air as three men, or 30 cubic feet of air per minute. Air flues should be built in interior walls, and the flues themselves should be either circular or square, or as nearly such shapes as possible. The flat flue is very objectionable. The registers should be about twice as large as the flue section. The smoke flue should be near the furnace; it should be large, square and smooth, and the chimney top should be a little higher than the highest part of the house. There should be no contraction of the flue at the top. A chimney pot smaller than the flue is an injury, while one full size is no better than a regular extension of the chimney.—*Ex.*

EFFECTS OF LAKES ON CLIMATE.—Much has been written of late about the supposed effect of Salton lake on the meteorology of Southern California. The late cloudbursts and unusual excess of rainfall in that region has been attributed to the vaporization from the newly formed body of water, notwithstanding the well authenticated showing of the Weather Bureau that the unusual phenomena alluded to had their origin, as such phenomena on this coast usually have, in meteoric disturbances as far north as Oregon. Such a body of water can have but very little to do with producing rain in its immediate vicinity. A lake of comparatively limited area has much more to do with the temperature in its immediate vicinity than with the rainfall. Indeed lakes have a wonderfully tempering effect on climate. Thus, according to M. Forel, the quantity of heat accumulated in the Lake of Geneva during the summer of 1889 was equal to that given off by the combustion of 31,000,000 tons of coal, or the amount carried by a coal train 1120 miles in length. The greater part of the heat is gradually discharged into the air of the valley during the cold season, thus producing a milder temperature in autumn and winter.

A SAWYER ON WINOS.—The bill of a moquito is a complex institution. It has a blunt fork at the head and is apparently grooved. Working through the groove and projecting from the angle of the fork is a lance of perfect form, sharpened with a fine bevel. Beside it the most perfect lance looks like a hand saw. On either side of the lance two saws are arranged, with the points fine and sharp and the teeth well defined and keen. The backs of these saws play against the lance. When the mosquito alights with its peculiar hum, it thrusts its keen lance and then enlarges the aperture with the two saws which play beside the lance until the forked bill with its capillary arrangement for pumping the blood can be inserted. The sawing process is what gratifies upon the nerves of the victim and causes him to strike wildly at the sawyer.—*Journal of Health.*

DIFFERENT KINDS OF STARS.—There are three well-defined classes of stars, judged by the quality of light they yield. In the first class are the clear white and bluish white stars like Sirius and Vega. These are supposed to be the hottest stars and the most luminous in proportion to the extent of their surface. Then there are the golden yellow or pale orange stars, of which Arcturus and Capella are fine examples. These have begun to cool. Finally, we have the deep orange and red stars, like Aldebaran and Antares. These have advanced still further in the cooling process.

MECHANICAL PROGRESS.

Modern Guns and Gunnery.

There is just being completed in the Washington naval ordnance foundry the first 40-caliber six-inch gun built for the navy. The length of a gun is technically measured in calibers and to say that a gun is 40 calibers long means that the length of its bore is 40 times its diameter. The length of the bore of this new gun is, therefore 20 feet, or, to be exact, 20 feet 3 3/4 inches. It is the longest gun yet built for the navy—35 calibers having been the limit heretofore. The additional length is expected to increase its efficiency, and it is expected that with the ordinary service charge it will give a projectile weighing 100 pounds the enormous initial velocity of 2150 feet per second. This will give the gun a very long range and a very flat trajectory at all ordinary ranges. The gun now being completed is one of a pair to be mounted on the triple screw flyer cruiser No. 12. The great range of these guns combined with the great speed of that vessel, it is held, will enable her to choose her own positions, and if she should fall in with an enemy with an old pattern of guns she would be able to do considerable damage while keeping out of his range.

What a Modern Gun Can Do.

Unless one is actually brought into business relations with the great science of modern warfare, it is difficult to conceive of the terrible power of the latest and largest guns. These engines of destruction, weighing 110 tons, hurl a projectile of solid steel 16 inches in diameter and nearly 4 feet long at a velocity of 2,079 feet a second. When tested recently, one of these guns sent a shot through 20 inches of steel armor, 8 inches of iron, 20 feet of oak, 5 feet of granite, 11 feet of concrete, and 3 feet of huck. Comparatively, a locomotive weighing 200,000 pounds would have to spin along the tracks at a rate of 135 miles an hour to strike a blow equal to that projectile. Think of the damage wrought in a railroad collision where the train speeds along at the rate of 30 miles an hour, and one may calculate the destructiveness of modern ordnance.

The Resistance of the Best Armor Plates.

One would think from the above that nothing which could float would stand against such a pounding. But the above plates were simply "steel armor," with granite, wooden and concrete backing. But American ships have recently produced a "nickel-steel plate," which is much stronger for protective armor than anything of equal thickness of steel alone. On the 5th of September the Navy Department at Washington made an experiment of the relative resistant capacity of steel and nickel-steel for protective deck armor. A 6-inch projectile weighing 100 pounds was fired against two targets, one composed of two 1 1/2-inch all-steel plates, and the other of two 1 1/2-inch nickel-steel plates. In the round against the nickel steel plate the projectile was given a velocity of about 100 feet greater than with the all-steel, giving a striking force of nearly 300 tons greater than against the all-steel plate. The result showed very clearly the superior quality of the nickel-steel, as the all-steel target was perforated, the projectile passing through both plates, two feet of oak and eight feet of earth backing. The projectile fired against the nickel steel glanced off without rupturing the upper plate. It made a small crack five inches long and an indentation about five inches deep. The projectile itself was shattered into small fragments.

Nickel-Steel to Take the Place of All-Steel

In consequence of the wonderful resisting power of nickel-steel over all-steel, as manifested in the experiment last above mentioned the Navy Department has since issued an order that the upper layer of inclined deck plates for Cruisers 12 and 13, the commerce destroyers, and of the battle-ships Indiana and Massachusetts, are to be constructed of nickel-steel.

The Contest Between the Gun and the Armor Plates.

It was but recently thought that the resisting power of armor plates, which a ship could carry and float with safety, was fully reached, and it was also thought to be quite as fully proven that the best ordnance was able to penetrate such armor. But now the circumstances appear to be reversed. The superior character of nickel-steel enables our ships to secure greatly increased resistance with even a much reduced weight, and the guns are once more in the background. Their best projectiles are shattered against the nickel-steel, and hence it follows that our gun makers must take another step in advance to meet the latest improvement of the armor plate makers. When or how this battle between the gun and armor plates will end, who can tell?

ENGLISH VS. AMERICAN SHIPBUILDING.—Notwithstanding the general superior quickness of American mechanics over those of every part of Europe, there seems to be a certain important point in which, in the matter of economy, English shipbuilders excel American builders. This specialty has been brought out by Mr. Charles H. Cramp of the famous Philadelphia shipbuilding firm, who has spent three weeks visiting the great naval yards of England. He recently gave a dinner to the officers of the English Admiralty, who afforded him facilities for inspection. In discussing the results of his

observations, Mr. Cramp said there is no money wasted on fancy work in the British war vessels. Everything not absolutely necessary is excluded from the outfit and equipment of their ships. The constructors know what they want and do not bother with doubtful possibilities as we do in America. There is a good deal of difference in the cost of warships here and at home. The excessive cost of our ships is altogether due to superfluities in the way of outfit and equipment, and the severe exactions and useless inspection of the quality of materials. As between America and England, there is very little difference in the cost of merchant marine vessels, such as the Inman and White Star lines, but the naval architect in England is far ahead of America and every other nation in the world.

AMERICAN ZINC ORE FOR GERMANY.—Efforts are being made to get the highly scientific ore reducers of Germany to become regular buyers and handlers of American zinc ores. The Southwest Missouri and Southwest Kansas Lead and Zinc Association has for some time had an agent in Germany working to get the smelters there interested in American zinc ores. He has been showing them samples of our ore and telling them of what immense quantities of ore carrying large percentages of zinc there are in the United States. The Germans have become convinced that if zinc ore exist in the United States in kind and quality represented they can make far more by handling American ores than they can with their own. The zinc producers of Missouri and Kansas and the zinc smelters of Germany are accordingly working together to have special transportation rates on ores made from the mines to the smelter, and to have the duties taken off zinc ores in Germany. These efforts to introduce our zinc ores into Europe will be watched with much interest by our American zinc miners.

STEEL BRIDGES.—There are now five steel bonds spanning the Ohio river and holding in close embrace the identified interests of Ohio and Kentucky. The last, between Cincinnati and Newport, is of the cantilever type and consists of two spans, 252 feet each in length, with an immense central span across the channel measuring 520 feet. In addition, there are two spans of steel trusses of 254 feet each, making the total length from the opposite approaches 2916 feet, or a little less than three-fifths of a mile. The bridge consists of a roadway 24 feet in clear width, with two street railway tracks for electric cars and two seven-foot sidewalks. The lower chord at the center of the span over the channel is 108 feet above mean low water, a height sufficient to clear any craft that moves upon the waters of the Ohio. There is probably no branch of mechanical engineering in which greater advance has been made during the last 40 years than in bridge construction.

STEAM WAGONS IN SAN BERNARDINO.—It is said that the owners of the San Bernardino county iron mines, near Hasett, propose to haul ore from the mines to the railroad with a steam traction engine. The steam wagon are already at Daggett, and were built by J. B. Osborn of that place, to haul ore 100 miles across the Mojave desert. Each engine hauls two trail wagons. The engines have 20 horse power rollers. Auxiliary engines are placed in the trail wagons, which are connected with the forward rollers by steam pipes. This enterprise will require the building of a special road of twenty miles in length. The wagons are expected to make a trip every two days, hauling twenty tons of ore.

AMERICAN IRON IN CANADA.—Canada, especially Ontario county, is just now absorbing large amounts of iron from the United States, where a year or two ago all the iron was imported from Great Britain. The iron which is thus finding its way into the consumption of our northern neighbor consists mainly of pig iron. Pig iron is selling to-day in Toronto, which goes all the way from Alabama. But especially and to a large extent other irons are beginning to follow in the course of pig. When we consider that Canada collects a duty of \$14.50 on a ton of bar iron which costs about \$27.50, and 60 cents per 100 pounds on common steel, we may well imagine the great benefit which would accrue to both countries from reciprocity.

CASTINGS FROM RAW ORE have been most successfully produced in Sydney. An ordinary blast furnace was employed and the castings produced were pronounced first-class. The experiment was made with 75 pounds of Tasmania ore, to which 14 pounds of limestone was added, and the iron ran into pigs, from which castings of various descriptions were made. Some of the iron so produced was put into a lathe to show that it was not too hard for working. The *Australian Mining Standard*, from which we condense, says that the iron proved to be of the very highest quality and of exceedingly fine and close grain and very tough.

AN APPROPRIATE AND SOLID PLATFORM.—When Major McKinley recently spoke at Mingo Junction, Ohio, the platform upon which he stood was made of pig-iron and steel billets with a floor of nail plate and walls covered with American tin plate. The roof was of the same bright material.

ELECTRICITY.

New Electrical Appliances.

Below will be found the new appliances of electricity which have come to hand since our last issue:

Electricity in Saw Repairing.

A most important novelty in the application of electricity to industrial purposes which has come to hand the past week is its use in repairing saws. The hardest steel at present successfully worked by the electric welding process is that used for hand saws. Besides the regular work of making the joint in continuous band saws, it has been ingeniously adopted for replacing broken teeth in finished saws. Formerly it was necessary to cut down to a smaller size any saw from which one or two teeth had been broken, thus losing not only the difference in price between the two saws, but also the entire cost of labor in cutting the original saw. Now when a tooth is broken out, they simply fit in a new tooth, which is electrically welded in place, and a drop of oil applied as the completion effectually restores the temper of the saw to a serviceable point.

Blasting by Electricity.

Electricity has been advantageously employed in firing charges for blasting purposes. But quite recently a method of actual blasting by electricity has been tried in Sweden with good results. This means consist of a voltaic arc produced between two carbon rods placed parallel. When the arc is moved close to the spot to be blasted an intense local heat is created, resulting in expansion that splits the rock.

New Application of Electricity in Warfare.

Electricity has been suggested for many purposes in warfare, and especially for the projection of light in order to disclose an enemy's position, and for various similar purposes; but now we have precisely the same means suggested for elevating a distant screen to conceal tactical operations against an enemy. The principle and mode of operating this device is given as follows: An atmosphere laden with a mist or smoke has a pronounced tendency to diminish the strength of an electric light. This beam of light crossed by another at a certain angle makes a perfect screen at the point of intersection. This will be adopted as a means of forming a screen, behind which tactical operations may be secretly conducted. Manifestly, there is no possible way by which this intangible screen can be either removed or penetrated by an enemy, except by destroying or driving away the opposing forces—the projectors. The great utility of such a device in military tactics must be obvious to every one.

An Electric Headlight for Horses.

A novel headlight has recently been invented by parties residing in Stockton in this State—Frank P. Adams and John E. Cook. The device consists of an electric light of two-candle power or more, run by a storage battery and placed upon the forehead of the horses. The *Stockton Mail* says that trials of the invention made in that city have proven that it is simple and eminently useful. It is also said that the storage battery need be the invention of Messrs. Adams and Cook, is one of their own invention, and cheaper and lighter than any of the same power yet devised.

An Electrical Piano Forte.

London *Iron* says that a very novel and most useful electrical attachment for a piano forte is on exhibition at the Frankfurt Electrical Exposition which is attracting much attention. It is the invention of a German soloist, Dr. R. Eichenmann, and consists in attaching a series of small electro-magnets to a metal running parallel with the keys of the instrument, one magnet being fixed above each string. One of the ends of the electro-magnetic wire is fastened to a metal rail, which, by the gentle pressure of a pedal, becomes connected with the electric current, while the other is brought in contact with a metal spring, which, when the key is struck, cuts out the current by the interpolation of current arresters, a microphone being applied in this case. On pressing the pedal and striking a key, the current flows through the windings of the corresponding electro-magnet, and through the microphone, the latter intercepting the current in exact proportion to the number of vibrations of the string. It is thus possible to prolong the sound as long as may be desired. The continuity of the sound, the strength of which depends on the force of the pressure of the key, imparts to the instrument the characteristic tones of the organ. But the results of the electrical action are found to be most surprising in the bass, the sounds emitted being described as a blending of the tones of the bass viol, violoncello and harp. The center notes of the instrument do not show any appreciable alteration in intonation, while the higher notes are said to bear a strong resemblance to the strains of an æolian harp.

To Prevent Scriveners' Palsy.

It is very generally known that the use of a steel pen, more or less constantly, causes a numbness in the fingers and hands which, with many, gradually passes into what is known as "scriveners' palsy," which sometimes quite unfits any one from writing at all, or at least only with a pencil. It is now generally supposed

that this palsy is induced by a current of electricity, which is produced by the friction of the pen upon the paper. It is well known that friction of any kind upon paper produces electricity, and it is very naturally inferred that this electricity is conducted through the steel pen and iron clasp to the fingers, which are generally moist and in contact with the upper portion of the clasp. The acidity of the ink no doubt greatly facilitates the production of the current. To avoid this, it has been suggested that the penholder should be made of paper, which is less a conductor of electricity than wood, and that the clasp which holds the pen should be made very short, so as to come below the touch of the fingers. The device is said to have been successfully employed, rolled paper being used for the holder. The gentleman who has made this suggestion and foregoes his privilege of securing a patent protection for his device, as he might have done, has been dubbed an "electrical crank." It would be well if we had many more just such "cranks," if they employed their crankiness in such a useful direction.

Electric Road Building.

New electric roads are constantly being projected and built in all parts of the country and in all parts of the civilized world as well. Our own city and State are no exception.

The Proposed Alameda Road.

Has already been noticed in these columns. The County Supervisors of that county have recently made a careful examination of the line of the proposed road, the motive power of which is to be electric. The road when completed will be about ten miles in length. It will commence at Shell Mound Park, go on to San Pablo avenue, come down toward Oakland a few blocks, then run along 45th street, pass Livermore's place, Thermal Vale Nursery, and go to the Catholic Cemetery. From there it will curve round, passing through Livermore's land and Dingee's field, passing to the north of Mr. Dingee's residence, skirt the foothills, pass Joaquin Miller's house, and come down east of the Hermitage. Then it will come along three blocks on the old San Leandro road in a westerly direction, cross through the Bray tract, and thence down to Fruitvale station.

An Electric Road to South San Francisco.

Irwin C. Stamp, Ahner Dohle, W. R. Hearst, P. N. Lillenthal, W. S. Chapman, Monroe Greenwood and William Hollie have petitioned the City Board of Supervisors to grant them a franchise for a street railway to extend from Market and Sixth streets to South San Francisco. The route proposed is along Sixth street to Brannan, thence to Eighth, to and across Townsend and Channel to Kansas, then to Santa Clara, to Connecticut, to Solano, to Kentucky, to and across Tular, Islals creek and Islals street, to Railroad avenue; and also from the corner of Kentucky and Solano streets along Kentucky to Fourth, and along Fourth to King. The petitioners promise that all the material entering into the construction of the road shall be of California manufacture, and propose that at least \$10,000 shall be expended within the first year, and two per cent of the gross receipts of the road be paid over to the city. This latter proposition presents a new and very proper feature which should enter into every city franchise of the kind.

The Road from Hayward to San Jose.

The Alameda Board of Supervisors have granted the charter asked for by Chapellel and others of Oakland for extending the line of road to the county line, whence it will be continued to San Jose by the same company. The particular electric system which will be adopted has not yet been determined on. So rapid is the march of progress in this direction that it is considered advisable to wait until the latest moment before deciding on this matter. The construction estimates of this road foot up fully \$400,000.

A Fresno Electric Road.

The County Board of Supervisors of Fresno have granted a franchise to Fulton G. Berry and J. R. White for a street-car line along Elm avenue, to be operated by electricity, cable or horse power. It is stipulated that the construction of the proposed line must be begun within three months, and completed inside of a year, otherwise the franchise becomes forfeited. It is understood that the intention of the projectors is to put in an electric line, and to begin work immediately.

The Mount Wilson Road Near Pasadena.

There is likely to be much rivalry in the construction of the railroad to the summit of Mount Wilson from Pasadena. The owners of the toll road propose now to widen it and build an electric road. Water has been found on the mountain, which can be run down 1,500 feet, and give 125-horse power to run a dynamo, and then be conducted 1,500 feet further down to run another dynamo. The two together would be sufficient to work the road.

A Portland Suburban Road.

Portland papers announce the organization of a company with a capital stock of one million dollars, and the purchase by the company of the Williamette Bridge and the Transcontinental Street Railways Companies, comprising over forty miles on both sides of the river, with connections across the two bridges. The lines on the east side are all electric or

steam motor lines. The latter will be changed to electric, and the lines on the west side will also be changed, and all cars from the east side will come into the city. When this is done the company will have one of the most complete street railway systems in the country.

STEAM BOILER NOTES

To Beat Steam.

The schemes to heat, in an economical way, steam made from water as a working fluid in an engine have been, and will undoubtedly continue to be, numerous. There is, beyond question, a wide field for the gas engine and the hot-air engine, for small power, not because either gas or air is, *per se*, more economical than steam, but because the conditions are sometimes such as to make the use of either gas or air advisable. The whole problem is complicated by the conditions that surround the case. That is, while it might be advisable to use gas or hot air for small power, no one would expect to run a two hundred horse power engine as cheaply with gas or hot air as with steam. But the fact that some fluid other than steam is best in each instance leads a good many to believe that steam is a poor medium.

Then in the instances of electric motors, they are in many instances an excellent means of distributing power, but in disclosing their use they are most ridiculously placed in the position of prime movers, as if, in nine cases in ten, their use did not make room for a very material increase in steam power.

An old idea is to use air and steam in combination. We have no knowledge of how old this idea is. But more than thirty years ago a farmer of Rensselaer county, N.Y., "invented" an engine in which a mixture of steam and air was to be used. He sold his farm to put his idea into practice, and after building an engine refused one hundred and fifty thousand dollars for a part interest, and the outcome was that he lost all his investments.

This scheme, in various forms, has come up ever since, and with great regularity. Sometimes it has taken the form of injecting air into the boiler, thence to be heated and mixed with the steam; sometimes some other means of bringing about the mixture of air and steam was employed.

The latest move in this direction is being made by Edward Field, C.E., of England. Mr. Field is well known by the boiler that bears his name, and he is impressed with the idea that by his plan of mixing a little steam with a good deal of heated air he will bring about important economical results.

As in most other cases of the kind, Mr. Field starts out with the rather popular fallacy that the air can be heated—up to 404°—by waste heat, practically without cost. However, it is said that he makes a saving of between forty and fifty per cent as between his mixture and steam pure and simple—a statement which we shall be glad to see verified, but in which, at the present, we have not the least faith.—*Am. Machinist*.

COMPOUND ENGINES.—Every pound loss of coal burned in a fire room means more profit for the business. It means less wear and tear on boilers, and less coal to be handled by the fireman. Because all this is coming to be better understood is one of the chief reasons why better devices can find a ready market. There isn't much reason in putting in a compound engine to save steam, and then generating the steam in a boiler that will evaporate no more than six or seven pounds of water per pound of coal. Compound engines are generally designed with special reference to the pressure of steam to be carried, and any means, such as a damper regulator, proper feed appliances—in fact, anything that will help the fireman in keeping his steam at that pressure will save coal. The boiler is usually calculated to stand a given steam pressure, and there are very few modern engines that will not give better results with the highest admissible steam pressure. Therefore not only should the fireman work to the end of maintaining the higher pressure, but he should be provided with the best means of doing this.—*American Machinist*.

HEATING BY RADIATION.—In applying Siemens' principle of heating by radiation, or free development of flame to boilers, it is necessary to prevent the flame, in its active stage of combustion from touching either the sides of the boiler or its brick-work setting. The flame is allowed free space to burn in, and thus good combustion is obtained, after which the products of combustion are brought into intimate contact with the surfaces to be heated. While combustion is going on in the open space, heat is transmitted by radiation only; but after active combustion is completed, it is transmitted by contact, and it is in this manner that flame must be applied to boilers, and may be applied equally well to nearly all heating operations.

THE PERRY STEAM ENGINE INDICATOR.—In this device a beam of light is reflected from a mirror mounted upon an elastic diaphragm, which is distorted by the steam pressure upon its opposite surface. The path traced by the beam is a true diagram of the working of the engine.

GOOD HEALTH.

HOT WEATHER SUGGESTIONS.—During the heated term a few good resolutions should be made. Among the first should be one to cultivate tranquility of mind. Nothing more conducive to comfort of body. In hot weather a fiery argument is almost as productive of a raised physical temperature as is a brisk walk in the blazing sun. Moreover, its effects are less rapidly dissipated, for it is easier to sit down and get cool after hotly exertion than it is to subside the perturbed mind that it will not once a series of "hot flashes" for possibly hours after a vehement discussion. The same rule that applies to minds exerts the same force and temper should be observed in intellectual pursuits conducted in the dog days. Do not attempt to shirk steady work in this line, but let all you do be done methodically not spasmodically. Adherence to the German motto, "Without haste, without rest," is really less wearying than a series of violent efforts resulting in a fatigue which can be relieved only by utter repose. So much for the mental attitude in hot weather. The hotly condition is of equal importance. Many people seem to think that seas in summer can only be obtained by laziness, that employment of any sort is the mortal enemy of *bien-être*, and so devote the whole of the long days to what is expressively termed "loafing." What wonder if for them the weeks drag drearily, and that they hail the return of shortened days and frosty nights as a release from ennui? There is no better way to keep cool than to have some regular occupation, be it never so trivial, that will serve to divert the mind from the hotly condition. No matter what this employment may be, whether the charge of certain branches of housework, the doing of the family mending, the conducting of a course of reading, the studying of a language or a science—whatever it is, let it be made a duty, and followed conscientiously.

THE VALUE OF WALKING TO HEALTH.—Few things, if any, are so effectual in building up and sustaining the physical organization as walking, if resolutely and judiciously followed. It is a perfect exercise. It taxes the entire system. When you walk properly every member and muscle, every nerve and fiber has something to do. The arms swing backward and forward, keeping step, as it were, with the legs; the chest expands and contracts as the lungs fill and discharge; the drummer boy pulse beats a tune for the march; the legs curve and straighten; the feet rise and fall, while the head rides over all—but not as a dead head. Every once it has is employed, every faculty alert. The nostrils expand to quaff the breeze; the ears turn to every sound; the eyes roll in their sockets, sweeping from left to right, from earth to sky; the brain is at work through all its parts. Progress under such conditions is the very essence of physical motion. What is the effect? The flesh is solidified; the lungs grow strong and sound; the chest enlarges; the limbs are rounded out; the tendons swell and toughen; the figure rises in height and dignity, and is clothed with grace and suppleness. Hunters, who walk much, are tall and straight, while sailors, who scarcely walk at all, are low and squat. The whole man is developed, not the body merely. The mind is broadened by the contemplation of creation's works, the soul is enlarged, the imagination brightened, the spirits cheered, the temper sweetened. The moral forces are strengthened equally with the physical. A loftier reverential feeling is awakened, if not a profound religious sentiment. No one who rightly walks the fields and groves, or climbs the heights beneath the heavenly dome, with its blazing sun by day and its moon and countless stars by night, but is irresistibly drawn toward the Infinite, as he "looks through Nature up to Nature's God."—*A Seagenerian, in Belford's*.

SWALLOW COLD DRINKS SLOWLY.—In my opinion, said a physician, it is not so great a mistake to indulge in cold drinks in warm weather as it is to drink them rapidly. On a hot day it is almost inevitable that people should drink, and what the system seems to crave is something cold. If that something could be a little less than ice cold it would be so much the better. But it is practically out of the question to get a drink of a temperature of 40° or 42°, say, which is about as cold as is necessary in order to meet the demands of nature. So, then, ice-cold drinks are likely to remain a permanency, and thousands and thousands of people will continue to drink them. Now, what I should advise is that they perform the operation with some deliberation. The man who swallows a glass of soda water, or anything else at a temperature of 32 or thereabout, does a dangerous thing. The danger is in suddenly chilling the nerves of the stomach, and the result may be sudden paralysis. There is neither sense or reason in drinking thus rapidly. I do not mean, on the other hand, that it is necessary to wait until the drink, whatever it is, has grown warm. What I plead for is that people should take 15 or 20 seconds, or even half a minute, in swallowing a glass of soda or beer, or whatever they use to satisfy their thirst. Everybody can afford that much time, even the most hurried man, and the result cannot fail to be decidedly advantageous in the long run.—*N. Y. Tribune*.



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SAN FRANCISCO:

Saturday, October 3, 1891.

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Passing Events.

The opening of the Stanford University this week is an important event in the educational and industrial advancement of this State. The instruction given will be largely of an industrial and technical character. Already a much larger number of students than was expected have applied for admission. Judging from appearances the new University will quickly become a popular one.

The discovery of tin in Washington is announced. It was found about one mile from the Culver gold mine on Peshastin creek, near the base of Mt. Stewart. Little is yet known of the real value of the ore.

The first section of the new belt-line railroad on the water front of this city was completed this week, and all that portion north of Market street will shortly be ready for use. This is an important thing for the whole city, and much expense of teaming will be avoided.

The Sacramento Supervisors have visited certain hydraulic mines of Placer county and conferred with the miners who ask for certain time to clean up their bedrock. The proposition has been taken under advisement and it is probable the men will be given specified time in which to do the work they want to.

FOREST FIRES in Eldorado county this week have been doing some damage along the Georgetown Divide.

The Situation in Iron.

The iron situation is receiving renewed attention, with the prevailing opinion being that all indications point to active markets and higher prices being near at hand. This opinion is not grounded on a speculative movement, although that may come, but upon a legitimate demand brought about by renewed life in all industries, consequent upon bountiful harvests and good prices. Taking one item of farm product—cattle—and the yield this year over that of 1890, averages about 30 per cent, while the prices that have been realized are fully 20 per cent more than were obtained in last year. It is this large increase in the crop and increase in prices upon which leading economists found their expressed views of better markets and better prices for pig iron. It is argued that the enormous sums of money which must flow into the hands of our farmers cannot help having a stimulating influence upon all kinds of business. As the *Iron Age* says, we must expect that the farmers will purchase liberally supplies and machinery, household goods and even some luxuries, and that many will be able to free their property from encumbrances. We must look forward, therefore, to more than the usual demand from the agricultural population.

To move the enormous crops the railroads will be taxed to their utmost and with their increased income derived thereby they will be in the market for both rails and rolling stock. Those in position to know unhesitatingly affirm that many railroad companies deferred their usual yearly purchases this year, owing to their finances not permitting them to buy, but next year these roads will be in the market as heavy buyers. That the railroads have been light buyers this year is witnessed in the small consumption by rail mills of pig iron (aggregating only from 125,000 to 150,000 tons per month), but notwithstanding these small purchases the stock of pig iron in this country does not show an increase, and this, too, in the face of the largest production within the history of the country. Let the rail mills be called on for increased quantities of rail and their consumption of pig would readily be brought up to over 200,000 tons per month. Such a large demand, added to the demands for iron from other quarters, as the result of general business activity, would simply strain the furnace capacity of the country to the utmost, besides using up the present stock of pig which would inevitably lead, as claimed, to better prices.

To Open New Asphaltum Fields.

It is stated that the Southern Pacific Co. will build a new branch line from Wade (a station on the main line south of Bakersfield) to Armona, the southern terminus of the new West Side line which the company intends to construct. Plans have also been prepared for another road to branch from the one from Wade to Armona, and reach a large deposit of asphaltum on the Coast Range. This line is between 20 and 30 miles long. Col. C. F. Crocker says it is very important to reach these asphalt beds, for it will give San Francisco a good cheap supply. This asphalt is mixed with coal dust and formed into bricks by hydraulic pressure and used as fuel in the S. P. Co.'s locomotives. Mr. Douty of the Pacific Improvement Co. says this fuel gives satisfaction to the engineers. It is made in small quantities in Oakland, but if the asphalt can be obtained cheaply, this style of fuel will largely replace coal.

The opening of these new fields by railroad service should be not only of great importance to that section of the State, but to the larger cities, where the material is now in much demand.

Most of our asphaltum, bituminous rock, and material of a kindred nature, now comes here from San Luis Obispo, Santa Cruz, Santa Barbara and Ventura counties, on the southern coast. None of the deposits back of the Coast Range have as yet been opened to any great extent. This State now produces some 50,000 tons a year of the various semi-solid bitumens generally known as asphalt. Utah produces some 3000 tons and Kentucky a few hundred. Aside from these, California furnishes the whole product of the United States. The production amounted to little until 1888, when it jumped from 4000 to 50,000 tons in this State, and this is now being annually increased. Old deposits

have increased their output and new ones have been opened. The material from the San Joaquin valley differs from that found on the coast, and is better adapted for fuel purposes when made into briquettes with coal dust. The coast product is mainly utilized for street pavements and sidewalks. The asphaltum industry of this State is now a very important one and is destined to become much more so.

The Stanford University.

The formal dedication and opening of the Leland Stanford, Jr., University took place on Thursday of this week. Over a thousand applications for admittance had been made before the opening and out of this number 320 students passed the examination and were admitted. At present there are only dormitory accommodations for some 300 boys and 60 girls, but many of the students will board outside the college grounds. Two more dormitories for girls are about to be built. That for the boys is one of the fine stone buildings on this coast, and alone cost some \$300,000. The inner quadrangle, comprising the recitation rooms, is all complete. This is built of stone, as are the power-house, engine-house, foundry and machine shops, which buildings are completed but not entirely equipped. The large museum building will soon be finished.

It is Senator Stanford's idea to make this educational institution as practical a one as possible, where boys and girls will be properly equipped to earn their own living. The industrial features will be prominent. It is not likely to be a "kid-glove" college for the children of the rich, but rather one where the great middle-class people will gather. Already, among those admitted, are a number who will perform work around the college in return for their board and lodging, while studying. Trains are to be run from San Francisco and from San Jose to bring day scholars, and in a short time the number now on the rolls will be largely increased.

The writer has visited the college several times in the past few months, and is impressed with the earnestness exhibited by the generous founder of this institution. It is no mere college "on paper," and though an immense amount of money has already been spent, it is very little compared with the sums necessary to carry out the whole general plan which has been adopted. From this time on, however, work will be carried on much more rapidly with the buildings to be erected. The outer quadrangle chapel and memorial arch, the most notable structures of the group, will soon be commenced.

Everything in and about the buildings is of the very best material and character. Nothing cheap or shoddy has been used. The buildings are of stone or concrete, and made to last.

Ten of the new cottages for the faculty have been finished and 30 more are to go up at once. It is probable, too, that a number of other buildings for the parents of pupils will be erected and rented.

We go to press too late to give an account of the dedicatory exercises, but feel assured that a visit to Palo Alto will impress parents with the great value this college will be to the young men and women of this community, even if it opened with no ceremonies at all.

Every possible thing for the comfort, health and convenience of the students has been sought out and adopted. A competent corps of professors and instructors is ready for work. Appliances of all kinds for instruction will be provided. With an abundance of money at command, the founder of this institution has been enabled to start fully equipped such a college as usually takes years to build up.

For the first year, 1891-92, chairs will be established, and instruction, undergraduate and graduate, will be given in the following lines of work, the character and gradation of the instruction to be adapted to the needs of the students in attendance. Mechanical engineering, civil engineering, mathematics, physics, chemistry, geology, botany, zoology, physiology, philosophy, ethics, history, political science, English language and literature, German, French, Latin, and Greek.

The entrance requirements are the same as for the State University at Berkeley. Tuition in all departments is free, but the price fixed at present for board in Encina Hall is \$3 per week. Rooms, with light, heat and attendance, are offered at the rate of \$1.50 per week for each person. If two occupy one room; \$3 per week if occupied by one person, but single occupancy will not be permitted if the rooms are needed by other students. Washing will be charged at cost. The expenses of the student in Rohles or Encina Hall (boys and girls dormitories) need not exceed \$200 for the year, President Jordan says, exclusive of clothing and railway fares.

The Molesworth Calcining Process.

One of the weak points of metallurgy is the "sweat" calcination of ores in a cheap and effective manner, combined with rapidity. This sort of calcination is very necessary when preparing fine pyrites containing gold, either for amalgamation or chlorination; in the first case, badly calcined pyrites would sicken the mercury; in the second case, the sulphate of iron formed would precipitate any gold that might pass into solution while still mixed with the ore.

Both chemical processes and mechanical appliances have been pushed forward at all times to facilitate the calcination of auriferous pyrites, and anything that will simplify the treatment of such ores is jumped at by the metallurgist, as it will give him command over a greater quantity of mineral matter, besides enabling him to handle alone that at present will not pay to work; yet, up to the present, it is hard to find any process or appliance better suited for calcining concentrates than the ordinary stationary reverberatory furnace, in spite of the many alleged improvements of various inventors.

Mr. Francis Hylton Molesworth of Adelaide is the author of one of the latest methods of calcining. Danvers Power, writing on a Victorian official report, speaks as follows of the process: He makes use of the fact that certain compounds act as carriers of oxygen, which is the vital element in calcination—that is, some compounds will take up oxygen from the air, but will give it up again when in the presence of anything that has a greater affinity for it. It may be thought that we might as well pass the air direct over the heated pyrites without the intervention of a carrier, but we must remember that when oxygen is in a nascent state—i. e., immediately it is given off—it is more active than in its ordinary condition in air. The slight expense of cheap chemicals is more than covered, if a more rapid calcination can be carried on, for not only do you lessen the labor charges, but the capital lying idle is greatly diminished. The chemist Mr. Molesworth prefers to use cyanide and sulphuric acid, these acting on each other produce a gas called nitric oxide, and this taking up more oxygen forms nitric peroxide.

A small trial plant was erected at Gawler, South Australia, and now a larger furnace with improvements is being put up at the Alma and Victoria mine, Wenkaranga, S. A. The furnace (see engraving) is made of iron, 15 feet long, of a conical shape, and set on an incline, with the smallest end lowest. This revolves on friction pulleys. The fire-box is under the smaller end of the roasting chamber; the products of combustion circulate along flues arranged round the furnace, and do not enter the furnace itself, thus avoiding the dilution of the atmosphere within it. The ore is fed in at the wider end of the furnace, and as it revolves, the fine particles are raised on shelves and split through the atmosphere, the whole gradually working its way down to the exit at the smaller end, on account of the tilt given to the apparatus; thus the reheating and drawing of the old reverberatory furnace is here made automatic.

The peroxide, together with fresh air, passes in over the ore at the exit end of the furnace, where the ore is already nearly roasted, and therefore will not rob them of much oxygen, besides being at its greatest artificial heat, for if not assisted by the heat conveyed to it by conduction, the heat due to chemical action of the ore would not be sufficient at this latter stage to complete the process; as the peroxide and air pass up the furnace, the oxygen combines with the sulphur, arsenic, etc., which is in a solid state in the ore, and forms a gas which increases in bulk; it is on this account that the furnace is made wider at that end the gases escape, and the ore is fed in. The gases, and any dust they may hear away, pass into condensing chambers under water, and are drawn into the stack by a fan. The fine dust is thus saved, and any acids present collected in the water, which Mr. Molesworth suggests using for subsequent treatment of the roasted ore. It will be noticed that it is only gas that is introduced into the furnace; the chemicals are not mixed with the ore, so it is not liable to clot together, and the heat is not sufficient to slag the minerals.

THE nugget recently found in the Ruby mine, Sierra county, is valued at \$3800.

World's Fair Buildings.

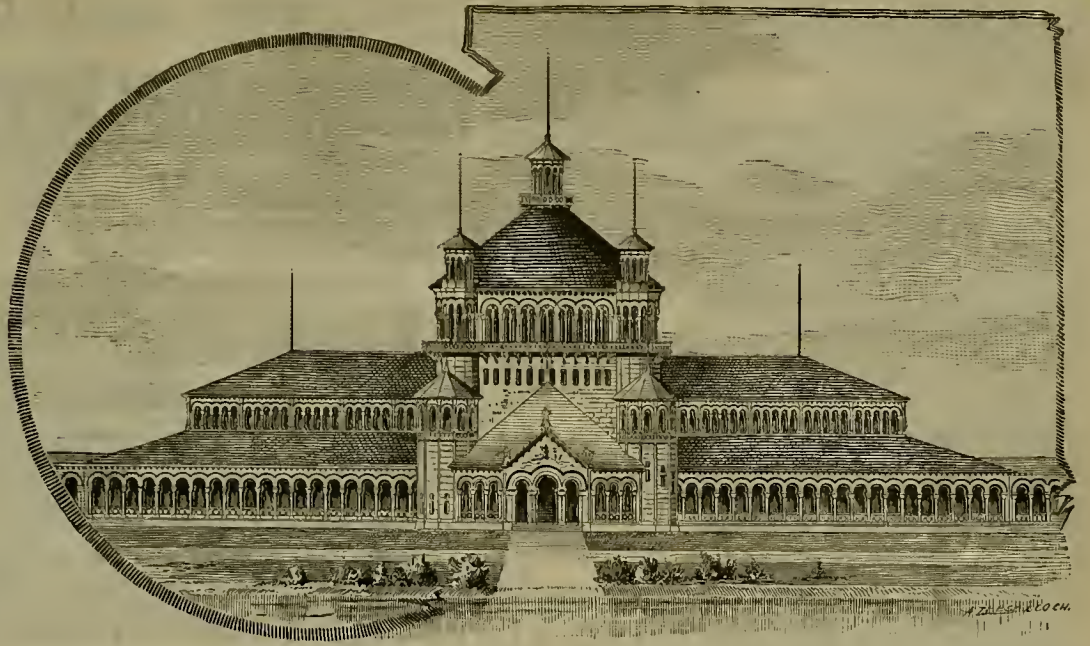
We give herewith an interesting group of views of buildings now in process of construction for the Columbian Exposition at Chicago. The lower one represents the building which will appeal most directly to the interest of California readers, and that is the structure devoted to the display of horticulture and horticultural products. The building will face an artificial sheet of water. In front there will be a flower terrace for outside exhibits, including tanks for nymphs and the victoria-regia. The front of the terrace, with its low parapet between large vases, borders the water, and at its center forms a boat landing.

The building is 1000 feet long, with an extreme width of 286 feet. The plan is a central pavilion with two end pavilions, each connected to the center pavilion by front and rear curtains, forming two interior courts, each 88 by 270 feet. These courts are beautifully decorated in color and planted with ornamental shrubs and flowers. The center pavilion is roofed by a crystal dome 187 feet in diameter and 113 feet high, under which will be exhibited the tallest palms, bamboos and tree ferns that can be procured. There is a gallery in each of the pavilions. The galleries of the end pavilions are designed for cafes, the situation and surroundings being particularly well adapted to recreation and refreshment. These cafes are surrounded by an arcade on three sides, from which charming views of the ground can be obtained.

In this building will be exhibited all the varieties of flowers, plants, vines, seeds, horticultural implements, etc. Those exhibits requiring sunshine and light will be shown in the rear curtains, where the roof is entirely of glass and not too far removed from the plants. The front curtains and under the galleries are designed for exhibits that require only the ordinary amount of light. Provision is made to heat each part as required.

The exterior of the building is in staff or stucco, tinted a soft warm buff, color being reserved for the interior and the courts. The appropriation for this building is \$400,000. It will probably be built for something less than this sum.

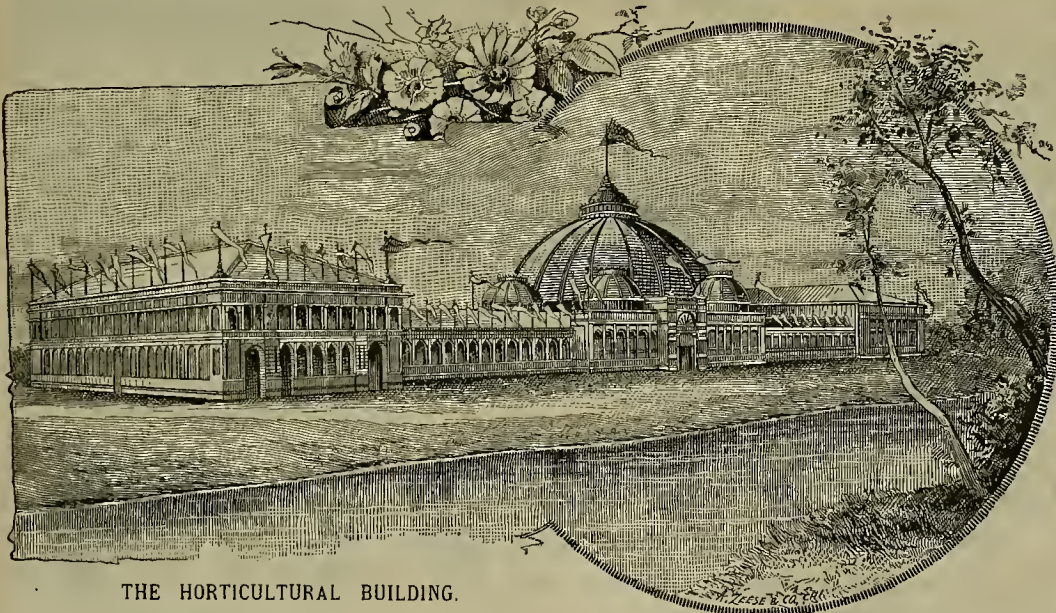
The central building illustrated



THE FISH AND FISHERIES BUILDING.



THE TRANSPORTATION BUILDING.



THE HORTICULTURAL BUILDING.

is the Transportation building, which will be located next to the horticultural building. The main building of the transportation exhibit measures 960 feet front by 256 feet deep; from this will extend westward a triangular annex covering about nine acres, and consisting of one-story buildings 64 feet wide, set side by side. As there will be a railway track every 16 feet, and as all these tracks will run east and west, these annex buildings may be used to exhibit an entire freight or passenger train, coupled up with its engine. It is likely that the display of locomotive engines will be quite stupendous, for they will all be

placed end on to the central avenue or nave of the main building. As there will probably be at least 100 engines exhibited, and placed so as to face each other, the perspective effect of the main avenue will be remarkably effective. Add to the effect of the exhibits the architectural impression given by a long vista of richly ornamented colonnade, and it may easily be imagined that the interior of the Transportation building will be one of the most impressive of the Exposition. The exhibits to be placed in the building will naturally include everything of whatsoever name or sort devoted to purposes of transportation, and will range from a baby carriage to a mogul engine.

The upper engraving shows the central portion of the Fisheries building. Excluded from the view are two smaller polygonal buildings, connected with the main building on either end by arcades. The extreme length of the building over all is 1100 feet and the width 200 feet. It is built on a banana-shaped island, and the building is subdivided into three parts, to conform to the shape of the site. In the central portion will be the general fisheries exhibit. In one of the polygonal buildings will be the angling exhibit, and in the other the aquaria. The exterior of the building is Spanish-Romanesque, and will contrast agreeably in appearance with the classic style of all the other buildings.

At other times we will give views of other Exposition buildings, some more imposing than those which appear on this page.

The Lamberton Mill.

In the Lamberton ore-crushing mill, illustrated last week, the crushing is done by a group of rolling balls nine inches in diameter, and ten in number. These, as is shown by the plans, are driven round a circular, cup-shaped track by a heavy rotating disc, the great weight of which, bearing on the top of the balls, drives them round, imparting at the same time a powerful crushing effect. The material to be crushed is fed from a hopper, marked A on Fig. 1, down the hollow vertical shaft B, diverging at the foot. Falling underneath the balls C, the material gets pulverized by them.

The balls have a compound motion given them, causing them to spin or screw as they roll round, and in this way they are preserved in truly spherical form. The action being rolling, not rubbing, insures that the minimum of power is used for driving. The parts subjected to wear—the balls, track and face of driving

disc—are made of the most durable material.

These mills are made for either dry or wet crushing. In dry crushing the fan-blades and scraper attached to the revolving disc create an induced current of air down the hollow shaft B, which assists in blowing the fine material through the screens D, the fineness of which regulates the grit of the finished product. In wet crushing the water is allowed to flow down the hollow shaft B, along with feed, and washes the ground material through screens in the usual manner common to stamp batteries. The great feature of this mill is its simplicity and ease of erection. It will, it is claimed, crush 15 tons per day of 24 hours. It has the additional merit, as our sketch shows, of being compact in form.

A phenomenally rich gold mine is reported as found in the Giant range of mountains about 200 miles from Chihuahua, Mexico. The yield is said to be in wire gold.

A Concrete Building.

The members of the Technical Society of the Pacific Coast went to Palo Alto on Saturday last on the invitation of E. L. Ransome, who has nearly completed two large concrete buildings for the Leland Stanford, Jr., University. One of these is the girls' dormitory. The larger one is the museum building and is the finest piece of building concrete work yet done in this vicinity. The structure is absolutely fireproof, and intended also to be earthquake proof. It is built on the system patented by Mr. Ransome, so as to be a homogeneous structure as to walls and partitions, there being no joints. Twisted iron rods are used for additional strength where necessary. The cement is mixed in the Ransome patent mixer and elevated to points where used. A large force of men has been at work on this building for some time and it is now almost complete. Even the interior arches and ceilings are of concrete,

The stairways are made of concrete and these will be covered with marble steps. The hallways will be finished in marble over the concrete. There is no wood anywhere in the building, the window frames, etc., being of metal. The exterior is furnished with a smooth coat of cement to resemble brown stone. The heavy columns of the entrance are, like the main structure, of concrete, and the statuary to enmount the building is moulded of the same material.

There are two concrete buildings now and others are to follow. They were built by contract by Messrs. Ransome & Onghing in an exceedingly short space of time. Stone buildings of equal dimensions would have taken three or four times longer to construct.

The owners of La Dura mine, Central Sonora, Mexico, employ 400 Yaqui Indians, at \$1 per day. They are not as good as white miners but stand the climate better.

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ABSTRACT OF CONTENTS.

Rules for Describing Patterns; Practical Geometry; Mensuration of Surfaces; Mensuration of Solids, and Capacities of Bodies; Table of Weights, etc.; Table of the Circumference of Circles and of the Areas of Circles; Rules for Rendering the Tables Useful; Size of Tinware; Capacity of Cylinders, and various other Useful Tables and Information; Practical Receipts, Varnishes, Lacquers, Cements, Metallic Alloys, Miscellaneous Receipts, Strength of Materials, with Tables. Index.

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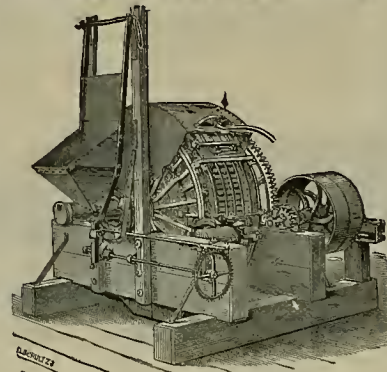
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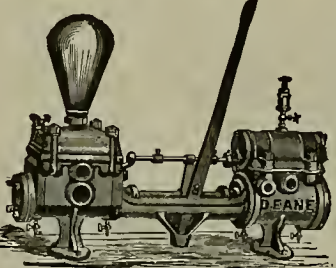
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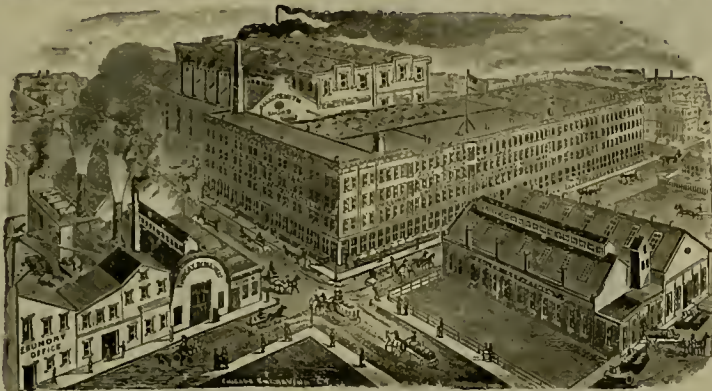
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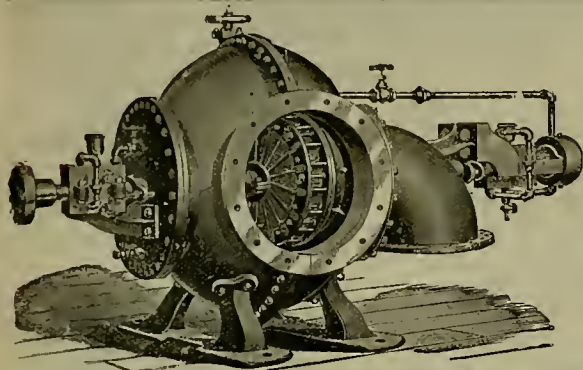
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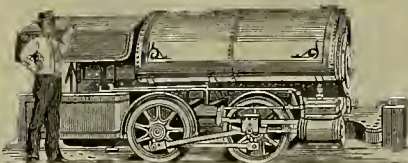
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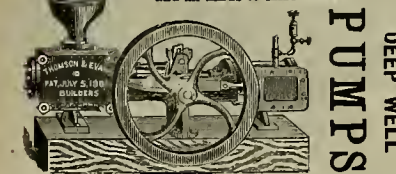
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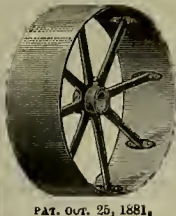
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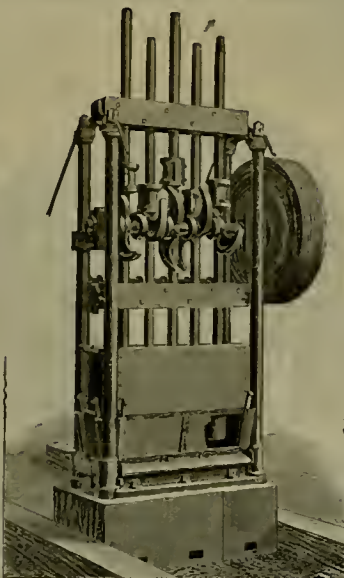
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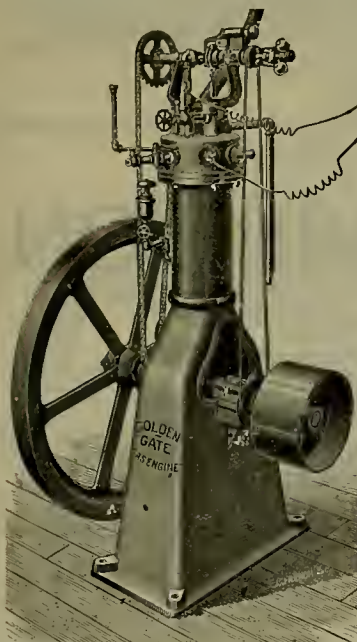
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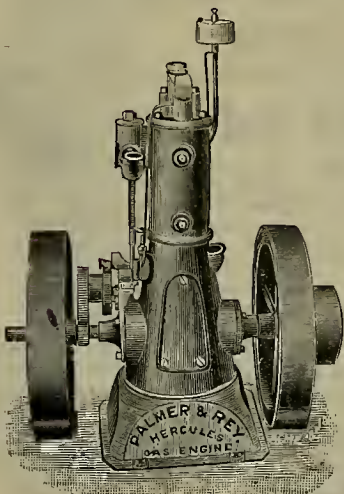
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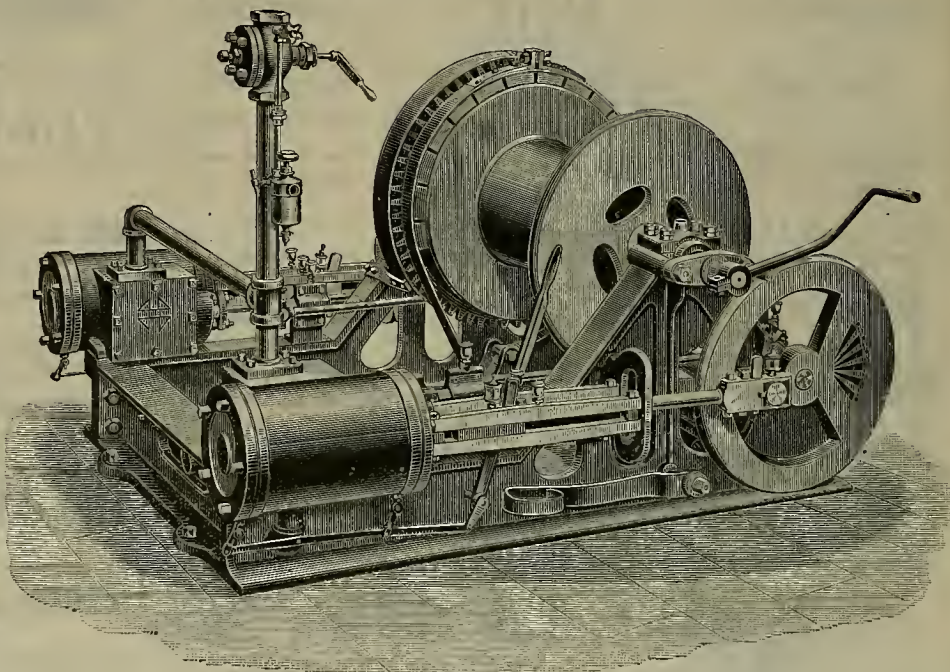
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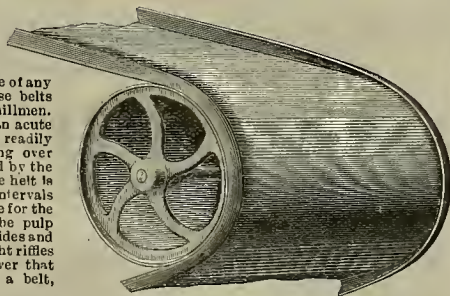
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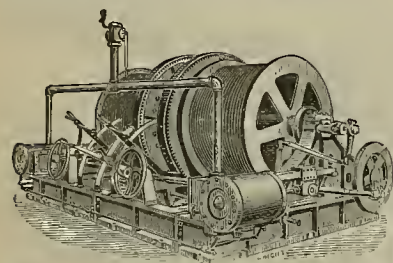
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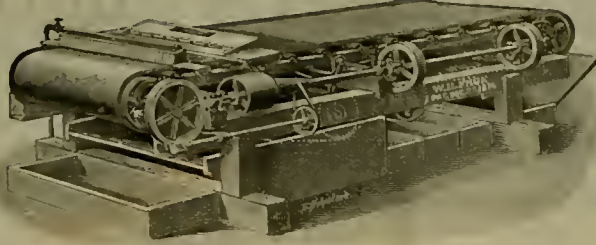
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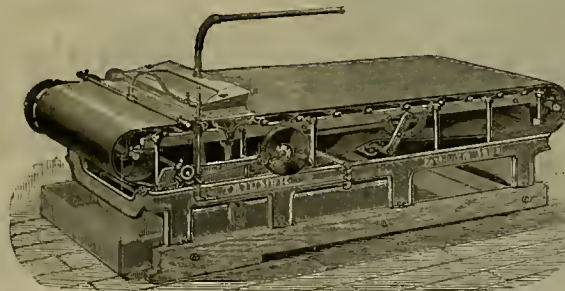
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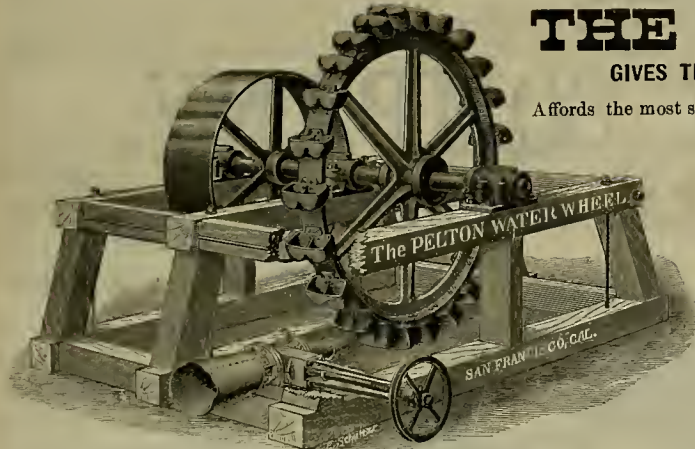
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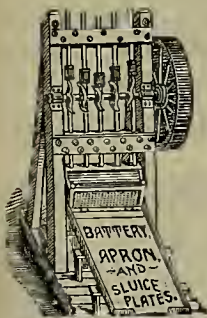
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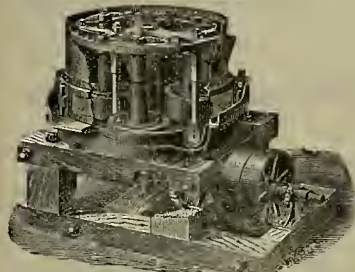
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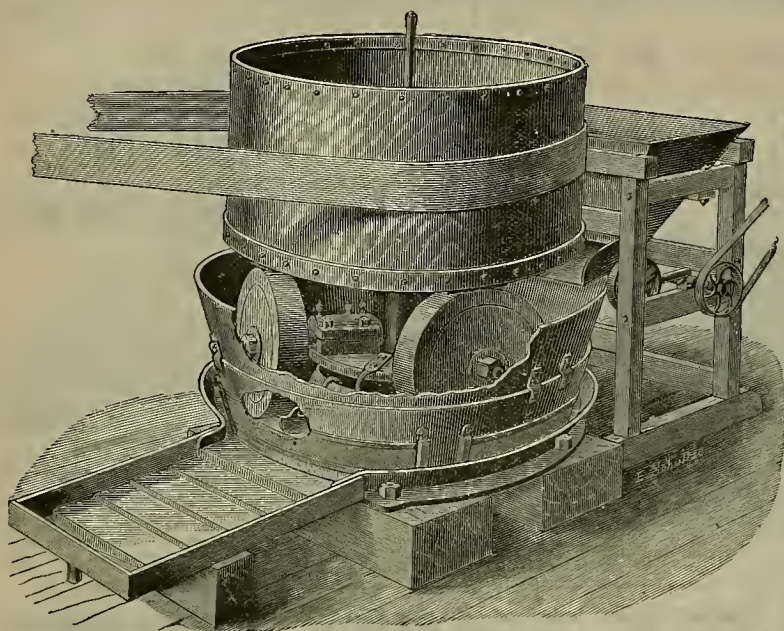
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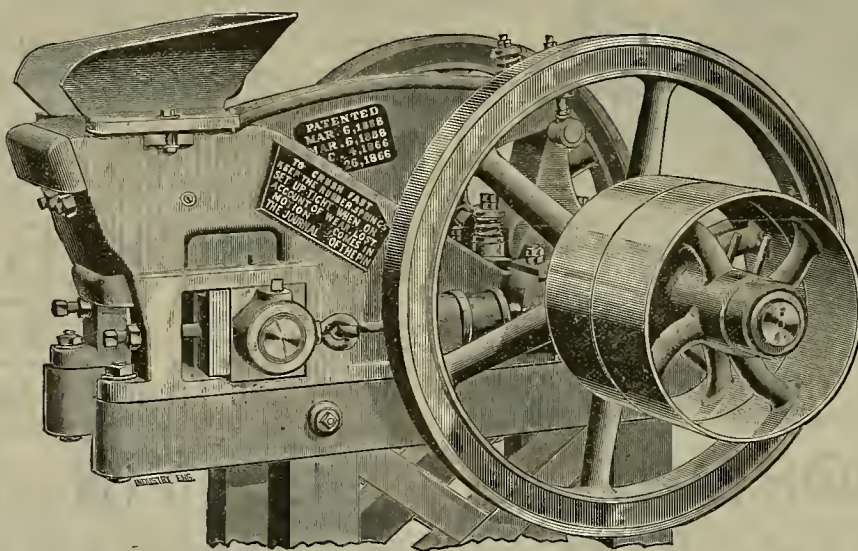
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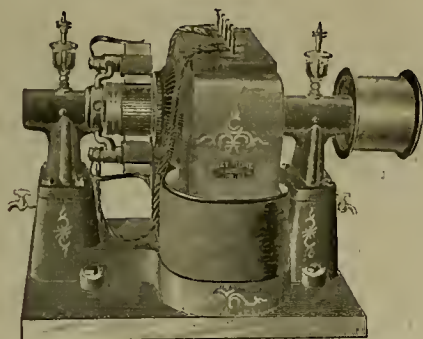
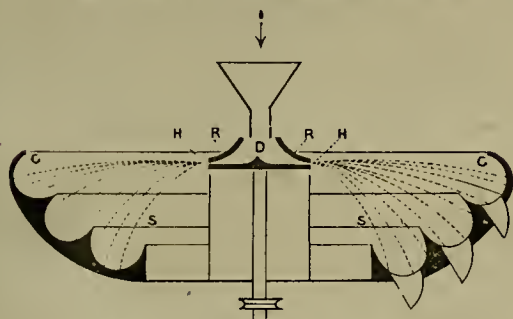
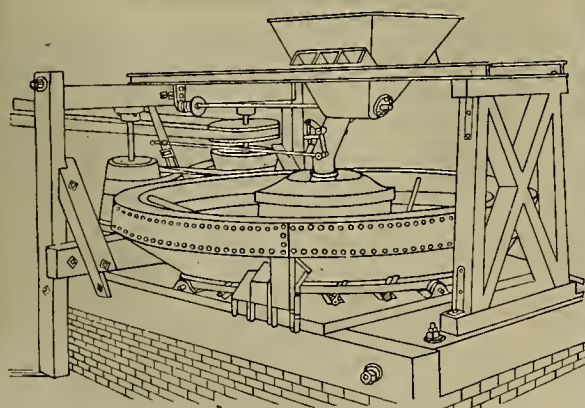


FIG. 1.—KEYSTONE ELECTRIC MOTOR.



SECTION OF CONCENTRATOR.



THE CLARKSON-STANFIELD CONCENTRATOR.

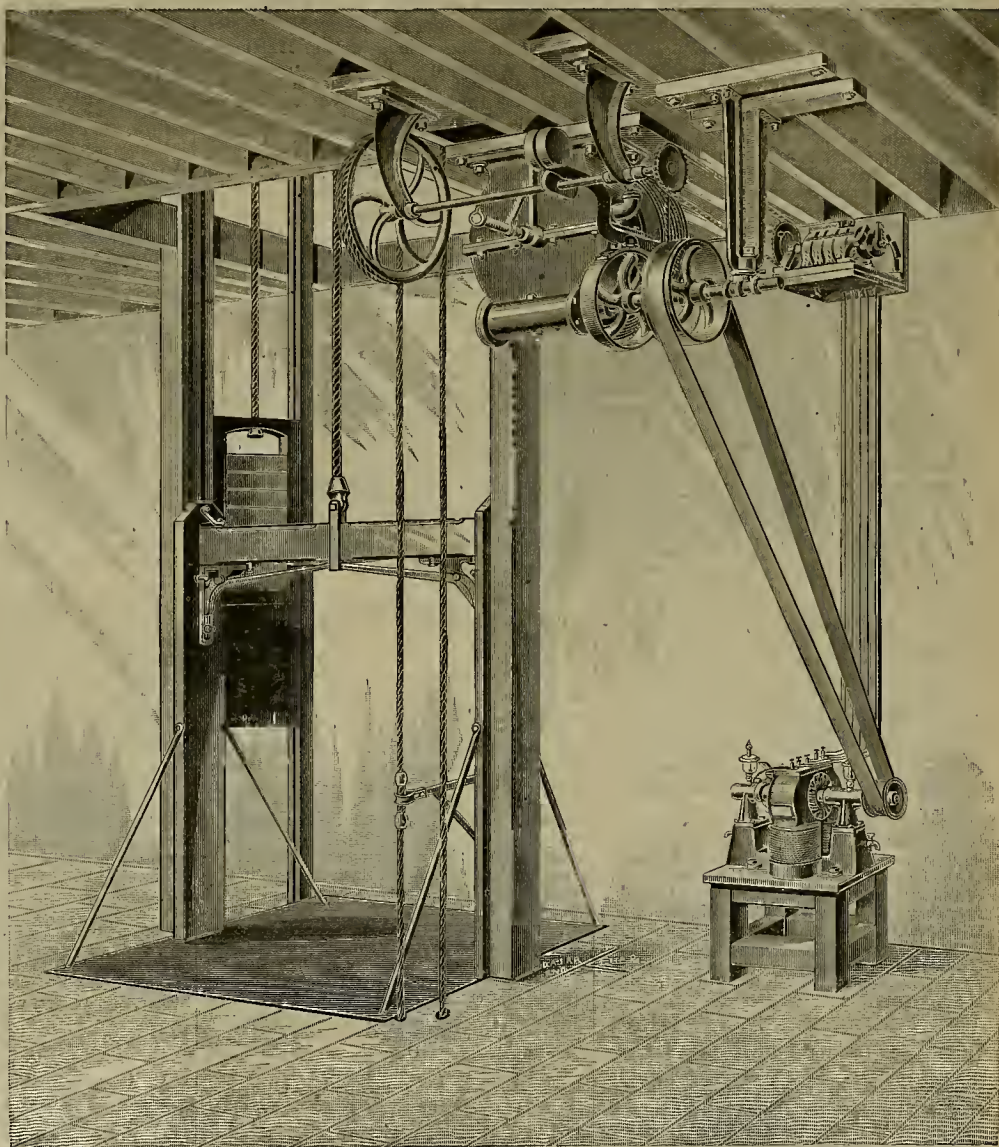


FIG. 2.—KEYSTONE ELECTRIC MOTOR OPERATING AN ELEVATOR.

Electric Motors for Elevators.

An effective motor designed for elevator work is that manufactured by the Keystone Electric Company of Erie, Pa. The machine, as shown in Fig. 1, is constructed in the most careful manner, especial care being taken with the armature bearings, which are of extra length and size. The company equips the motor with either sight feed oil cups or automatic self-oiling bearings with ample cellars, so that there is no waste of oil therefrom. The motor can be connected either with elevator or hoist of ordinary construction, either by belt as shown in Fig. 2, by gearing, or coupling the armature directly to the end of the driving shaft of the elevator or hoist.

There is no rheostat or resistance mechanism used with the motor, the controlling and reversing switch being connected to and operated simultaneously with the brake mechanism of the elevator by means of the ordinary hand rope in the car or by means of any of the ordinary de-

vices used for starting and stopping elevators. The motor receives the full force of the current without injury and without any danger of the armature burning out. It runs only while the elevator is in actual use, consequently no current is used when the latter is standing still, economizing in the use of current and in the wear of the machinery. The elevator can be instantly started or stopped at any point without the slightest jerk or jar, and reversed and started in the opposite direction with perfect safety.

The company makes these elevator motors in standard sizes of 3, 5, 7½, 10 and 15-horse power, and other sizes specially built to order. In point of durability, efficiency, mechanical construction and economy of operation, they are guaranteed to be superior for this purpose, and there is a total absence of noise or jar while in operation.

MESSRS. RIGGS & TITMAN, of Josephine county, Oregon, have recently discovered what promises to be a valuable slate quarry.

The Clarkson-Stanfield Concentrator.

Thomas Clarkson, 1st Demonstrator of Metallurgy at Kings College, London, and Richard Stanfield, Professor of Engineering at the Heriot-Watt College, Edinburgh, have invented an ore concentrator which is herewith illustrated. The dry process is employed, and the action of the concentrator is based upon the joint operation of centrifugal force, atmospheric resistance, and gravitation. Referring to Fig. 2, pulverized ore is fed on to the center of a rapidly rotating disc *D*, provided at the periphery with a raised rim *R*, which is perforated by a large number of small radial holes *H*, through which the ore is thrown by centrifugal force. The particles of rich and heavy ore, by reason of their superior inertia, are thrown to a greater distance *G*, while the worthless particles are more quickly overpowered by the force of atmospheric resistance and gravitation, and thus fall short at *S*. The collection of the ejected ore is easily accomplished,

A Welch gold ore, consisting of auriferous pyrites and galena with a quartz gangue, and containing only 20 pennyweights to the ton, was finely pulverized and sized between 70 and 90 mesh. After passing through the concentrator, it is stated that the material from each compartment was assayed with the following results: No. 1 (top) compartment, 56 oz. 10 dwt. per ton; No. 2 compartment, 4 dwt. per ton; No. 3 and No. 4, barren.

VENTURA OIL WELLS.—There has been a remarkable growth in the oil industry of Ventura county during the past year. A statement shows that the Union Oil Co., which is a consolidation of four companies, has a daily output of 500 barrels. It has driven 25 new wells during the year, each flowing from 4 to 40 barrels daily. The demand exceeds the supply. The Chino sugar factory takes 150 barrels daily for fuel. The oil is delivered by carload lots at \$2 a barrel, three barrels equaling one ton of coal. There are two other companies in Ventura.

CORRESPONDENCE.

We admit, undorsed, opinions of correspondents.—Eds.

Shasta County Mining Interests.

NUMBER II.

[By Our Traveling Correspondent.]

The J. I. C. Mining Co.

Joseph Fallen is superintendent of this company's mines, which are situated between the east fork of Clear creek and Cline's gulch, four miles from French Gulch.

The vein is opened by two tunnels. No. 1 is 350 feet long with drift 60 feet long on the eight-inch to three-foot vein. The upper tunnel is 150 feet long with drift run 106 feet on the 6 to 18 inch vein. The walls are both black slate. While the vein is not as large as in some of the other mines, the ore's values more than make amends. Large crushings of ore have averaged \$100 a ton in free gold, while no ore has gone below \$50 a ton. The ores are hauled to the mine's five-stamp mill, two miles distant, to be crushed.

The Washington.

J. S. Senter is superintendent of this mine, which is about three miles west of French Gulch on the old road from French Gulch to Deadwood. The Washington is one of the pioneer mines of the State. The vein was opened and a mill erected in 1852. This old-time mill embraced all the devices for crushing the rock and saving the gold that were known at that time. The batteries were wooden troughs lined with sheet iron, with wooden shaft and iron shoes and dies. The cams were a solid log with projecting shoulders cut out of it, which were covered with sheet iron. The gold was caught principally in the battery. At that early day the need of a concentrator was felt and one was constructed, having iron riffles to settle the gold. A crank was attached which gave the table both a side and end motion. The surface ore of the Washington was so coarse, free and rich, that with this crude way of working the mine paid handsomely. About 1870, a six-stamp iron battery was put in and plates added.

Owing to the want of knowledge of the properties of cyanide of potassium, considerable trouble was experienced in coating the plates. About this time a tunnel was started from the north side of the hill through 1400 feet to the south side of the mountain, cutting the vein 200 feet deep. Only the ores that were known to exceed \$10 a ton in value were extracted for milling. All below that value was left standing. The ores milled averaged from \$30 to \$50 a ton in free gold. After that time two tunnels were driven on the vein, each 600 feet lower. The ore from the middle tunnel averaged \$19 a ton. The greater part of the ore was left standing, as it was not thought to be high enough in grade to pay for working. In the lower tunnel none of the quartz was milled, as it was not considered to be high enough in grade.

It is a question whether the lower results obtained from this ore were not due to the higher grade of the ore, this seeming "bull" being due to the fact that at this depth the greater value of the ore was no longer free and was therefore not recovered in the system of milling employed at that time. For want of satisfactory returns the mine was shut down, although there was still standing, all ready to stoep out, thousands of tons of ore but little below \$10 in free gold values, with a 2 to 25 foot vein to draw on. Thus the mine stands to-day, awaiting the coming of a man with modern ideas of mining and milling and with sufficient "sand and soap" to carry it through. Since the closing down of the old mine the owners have been mining feeders that lead to the veins. These feeders run from two inches to two feet in width. In working these feeders the owners have learned that all gold does not glitter; for, while the ores will give a fair and satisfactory return by free-milling process, the selected ores on hand for shipment, at the time of my visit, assayed \$153, \$179, \$229 and \$320 a ton, thus going to prove that the old Washington holds in her walls a vast store of wealth, far in excess of that obtained by working the old free-milling quartz.

The Niagara.

The Niagara, Wm. T. St. Auburn, superintendent, is situated immediately above the old Washington mine and about five miles west of French Gulch. The mine is opened by five tunnels. No. 5 or the lower tunnel is in 2300 feet, with no vein encountered as yet. No. 4 is 400 feet long and onto the vein which has been drifted on for a distance of 700 feet and showed 34-foot vein. No. 3 was run 220 feet and cut the vein which was drifted on 400 feet. No. 2 is 150 feet. No. 1 is 600 feet long with a drift of 500 feet. The ore from the different veins has run all the way from \$10 to \$60 a ton. The mine has a complete plant and is running 18 stamps at this time.

The Milkmaid.

J. S. Senter is owner of the Milkmaid, which is just opposite and parallel to the Washington. The mine is opened by a 100-foot tunnel that cuts the 3-foot vein about 100 feet deep. Ore from this vein has been sold to J. Bell of Shasta for reshipment for \$50 a ton. The average ore is milled in the mill of the Washington mine

and the results have been very satisfactory to the owner.

Little Gem.

Wenh Bros. are proprietors of this mine, which adjoins the Niagara. The owners have just got into the ledge, the ore of which shows well in free gold, and owing to the neighborhood, promises well.

Unity Gold and Silver M. Co.

W. D. Biegle is superintendent. The mine is located 34 miles north of Redding on the east of the Sacramento river. The property is developed by shaft and a tunnel. The tunnel is driven 125 feet with the veins. Three shafts have been put down—No. 1, 40 feet; Nos. 2 and 3, 45 feet each. The veins run from 3 to 25 feet in width. The owners claim that the ore from the 14 ledges owned by the company will average \$160 a ton in gold and silver. The vein matter is quartz with porphyry hanging and slate footwall, which in places changes to dolomite.

The mine has a Kendall mill with a capacity of 20 tons per day. The ores are treated by a process invented by the superintendent, by means of which all the waste sand is extracted and the mineralized ore concentrated. The superintendent claims that by his process 95 per cent of the ore values can be saved.

Black Bear.

This mine is seven miles west of Redding on Miletown mountain. The vein is opened by tunnel and shaft. At this time a crosscut tunnel is being driven which will cut the vein 200 feet deep. From this tunnel drifts run on the vein will cut the vein 800 feet deep. The vein in the upper tunnel is from 2 to 4 feet. The ore's value ranges from \$55 to \$2500 a ton. Jos. Bell is superintendent of the mine.

Sunny Hill.

Jos. Bell is superintendent of this mine, which is about 25 miles west of Redding, and is opened by shaft and tunnel to a depth of 200 feet. The vein runs from 2 to 4 feet and carries a 2 to 12-inch streak of ore that assays from \$200 to \$600 a ton.

Eureka Tellurium G. M. Co.

P. Scherer is superintendent of this mine, which is three miles northwest of Redding, on the south bank of the Sacramento river at Middle Creek Station. The superintendent is driving a six by eight-foot tunnel with Phoenix drills and air compressors. The tunnel is now in 50 feet with 75 feet to go to strike the vein 160 feet deep. The mine is also opened by shaft to a depth of 100 feet. The ore from the old workings assays from \$40 to \$40,000 a ton. It is the superintendent's intention to now develop the mine.

The Celestine.

The mine is in the Grizzly Gulch district, four miles east of French Gulch. L. McDonald is superintendent. The company is driving a tunnel to develop the properties. The old Iron Mask mine is being put into shape to resume operations. One of the most extensive and valuable mining sections of the county is that beginning at the Calumet mine, two miles above Middle creek, and running north to the Walker Bros.—on Utah and California—Spanish, Central, Shasta, Mammoth and Texas. These mines are in porphyritic slate. The quartz is white, with occasional ribbon streaks. The average ores carry a fair percentage of high-grade sulphurets. While some of the superintendents claim that the greater part of the ore's value can be saved by ordinary wet-mill process, others contend that only a small percentage can be recovered from the ore by wet stamp-mill process. On some of the mines the ores are given the most thoroughly exhaustive treatment. Others content themselves to sort their ores, ship the high grade for smelting, and mill the lower grade, while others again mill all of their ores. Unfortunately, the mines run along the mountain side some one to three miles from the river, thus necessitating the hauling of the ore for that distance to the mills, which are all situated on the north bank of the Sacramento river. It would look as though it would pay these mines to bring in a ditch and place their mills at the mines. If sufficient water for power and mill could not be secured, water for battery alone would suffice, as the Sacramento river would run all the dynamos and generate sufficient electric power for not alone the mines of this section, but the entire State.

The Calumet G. M. Co.

Almarin B. Paul is superintendent of this property. The company's works are located on the bank of the Sacramento river, two miles above Middle creek.

The mines are three miles distant, the ore being conveyed by tramway to the works.

The mine is operated through a system of tunnels having an aggregate length of 1000 feet on the vein and a depth of 200 feet. The vein runs from two to ten feet in width, and gives from \$3 to \$75 a ton in gold values. The gold is exceedingly fine, and therefore very difficult to save. To secure the greatest percentage of the ore's value, Mr. Paul has being erected a double-system mill, one side being for the wet treating of the low-grade ores, the other for dry working of the higher grade of ore.

The Paul Dry Process.

In this mill the ore is dried, then passed through rock-breaker to a Paul pulverizer; from the pulverizer to the Paul harrel amalgamator, where quicksilver is added and the ore amalgamated. The ore then drops into

another harrel, when warm water is added, the amalgam gathered, and the pulp discharged. From this harrel the amalgam is drawn off into a tank of Mr. Paul's invention. Here the amalgam settles of its own weight to the bottom, while the lighter quicksilver, freed of its gold, flows out through a siphon. This tank is kept under lock and key, and can be cleaned up as desired. The ore, after leaving the harrel, is fed on to a stationary amalgamating plate, then on to a vibrating amalgamating plate, over which there swings a set of iron "fingers," which serve both to distribute and agitate the ore. From these plates the ore passes on to a system of vibrating blankets, where the sulphurets are caught. Mr. Paul claims that this system will work to a higher percentage of the ore's values than any other milling process.

The Paul Wet Mill.

In this mill the ore is crushed in a rock-breaker which feeds direct to a Paul circular stamp battery of 12 stamps having a capacity of 20 tons per day. The whole system of stamps is lifted by a revolving cam, on the screw system. Mr. Paul claims that the circular battery has this advantage over the other batteries, that the feed in the circular is the same to all the stamps, and that in consequence they all do an equal duty; while in the straight battery, the end stamps do very little work. From the battery the ore flows over silver-plated amalgamating plates, then on to oscillating blankets, the ore then flows into a set of tanks and settlers where, after the ore has all settled, the water is drawn off and the ore then fed to a system of 17 "Paul Americanized Arrastras." These arrastras leave little to be desired—the bottoms and drags are moulded into shape, and composed of Portland cement and the quartz ore of the mine, so that while the drags and bottoms are grinding the ore, they in turn, are being ground up with a loss of the cement only. This system of molding the bottoms into keystone slabs, that have but to be dropped into place or as quickly lifted out, is a great saving in time, while the riffles or grooves moulded in the bottoms make the necessary pockets for the amalgam. It would seem as though nothing could escape after passing through either of Mr. Paul's processes; but not satisfied, and not bigoted, but seeking for the best Mr. Paul has investigated the McArthur Forrest process and added it to the plant of the mine. Finding it very satisfactory the officers of the company organized the Shasta Gold Ex. Co., with Mr. A. Paul as manager, and have erected a plant on the opposite bank of the Sacramento river, as before stated in this article.

The Texaco Con.

R. G. Hart, is superintendent of this mine which is just north of the Sacramento river, eight miles north of Redding. The mine is opened by four tunnels, No. 1 or the upper tunnel is 290 feet; No. 2, 300; No. 3, 350; and No. 4, 450 feet. The lower tunnel cuts the vein 650 feet deep and shows an average width of eight feet of quartz vein matter, which mills \$16 a ton on the average. The ore is conveyed from the mine to the mill, a mile distant, by the Hallidie wire-rope transmission system. The mill is on the north bank of the river, one mile below the mine, the mill is of 10 stamps with 10 more being added, which will bring the crushing capacity up to 40 tons a day. The Texas carries a good percentage of high-grade ore, carrying a large per cent of high-grade sulphurets and in some of the quartz a fine showing of visible gold. This class of ore is sorted out, and after being crushed and sampled in the company's dry sampling mill, is shipped for smelting. The superintendent and company owner, Mr. Hart is very highly elated over the excellent showing of the mine and evidently has every reason to be.

The Central Mine.

A. A. Anthony, is superintendent of the company. The Central Co., takes in the Central, Spanish and Shasta locations, and is about in the centre of the mines on the belt. The mine is opened by tunnels, No. 1 or the lower tunnel is in 450 feet and cuts the vein 350 feet deep. No. 2 or the upper tunnel is 135 feet long. The average width of the vein is six feet with an average milling value of \$14 a ton. The ore is conveyed by wagon to the company's mill on the north bank of the Sacramento river, where it is crushed in Huntington mills. At this time the superintendent is developing the mine.

Mammoth.

The Mammoth, J. H. Morton superintendent, lies between the Shasta and Texas. The developments consist of two tunnels. No. 1, or the upper, is in 300 feet; No. 2, or lower, 704 feet, both on the vein, which is cut 205 feet deep. The vein runs from 4 to 26 feet in width with an average milling value of \$18 11, a ton. The ore is hauled by wagons, 14 miles to the 10-stamp mill. In the Mammoth ores and all of the other mines on this belt there is about 14 per cent of sulphurets that go \$4 60, to the ton.

Utah & California G. M. Co.

Walker Bros. of Salt Lake are the owners and H. D. Rippeto superintendent of this property. The Walker mine joins the Calumet and Spanish. The vein is opened by two tunnels. The lower is a crosscut tunnel 500 feet long, with drift run 900 feet on the vein. The upper tunnel and adit is 900 feet on the vein. An additional tunnel has been started, which has

been driven 550 feet, with 550 feet to go to strike the vein 425 feet deep. The vein averages nine feet in width and has milled \$10 a ton in free gold. The mine's mill is 4700 feet below the mine, on the north bank of the Sacramento river. The stamps are ten in number, of 1200 pounds each.

At this time the Utah & California is being developed, while the mill is leased to the Mammoth mine.

Prospects.

In addition to the mines mentioned, there is scattered throughout the county a large number of prospects that give promise in their high grade of ore, of being of value when sufficiently developed to show their extent. While Shasta has every reason to be proud of the large veins and high milling values of her gold quartz mines, she holds in her borders the highest mine in the State in

The Iron Mountain Mine.

Camden, Magee & Sallie are the owners. The mine is on Iron Mountain, eight miles north of Shasta. The property was first located as an iron mine, but subsequently found to be rich in silver and gold. The company's property takes in one mile on the vein. It is an exceedingly difficult matter to convey an idea of the immense body or extent of this wonderful deposit of mineral. From the base of the hill to the summit, the iron crops out in irregular masses through the porphyritic slate, country rock—a veritable mountain of ore. On the side of the mountain a series of crosscut drifts have been run in to the vein, and levels driven out from these. As you walk into these drifts and ores and recesses from one to the other, with a solid body of ore above, below and on both sides of you, the supply seems inexhaustible and immense. Stepping across from one wall, I measured 250 feet, when I came to a miner drifting ahead in solid ore. Just how many feet more it will take to reach the other wall is hard to tell. Certainly the walls are 300 feet apart, and perhaps 500, and all the intervening space a solid body of ore. At no time since I wrote up the mines of Dakota, with their 300-foot vein, have I seen any thing that would in any way compare with the Iron Mountain in the extent of the ore body. The mine was opened in 1880, when it was found that the ore carried iron, copper, sulphur, silver and gold, and a mill was erected to treat the ore for the silver and gold values. The only copper saved is that which is precipitated from the mine's water by allowing it to flow through sluices filled with scrap iron.

The croppings on the lode are iron, 200 feet in width, with spurs breaking out all the way down the mountain-side. The crosscut drifts cut the vein at a depth of 80 to 150 feet. From the surface down to a distance of 80 feet, the ore is heavily charged with iron, and is called free milling. This, the cap ore, carries a larger per cent of gold than the ore underneath. At 80 feet, the ore suddenly changes, giving the appearance of a floor. From this depth down, the ore is a solid mass of sulphurets. This is so clean that a handful of the decomposed ore looks like exceedingly clean sulphurets from a concentrator.

These sulphuret ores require roasting before being added to the other ores. As you walk through the mine, which reminds one more of an immense cave, the foreman sticks a pick into the floor, every few feet, and brings up a solid body of sulphurets; or digging into the sides, shows a continuous body of ore for 400 feet on the vein and 250 feet across it. The ore extracted now is simply an assay sample in comparison. If the mine could have a year's solid development put on and in it, the property could supply thousands of tons of ore a day and keep up the supply indefinitely.

The mine has a 20-stamp silver mill; 15 stamps are run on the free-milling ore and 5 on the sulphuret.

The free-milling ores are dried in a large chute extending from the mine down to the level of the mill. From a bin, at the bottom of the chute, the ore is conveyed by cars to the mill, where it is powdered in batteries that were intended originally for wet crushing. For want of proper appliance, a vast amount of the ore is lost in the form of dust that floats up and out of the mill in a continual cloud. From the batteries the ore feeds into a bin from which it is distributed to a system of 12 pans and 6 settlers, with two-ton charges to the pan, and the ore treated for six hours, or four charges a day, making the capacity of the mill about 100 tons a day—when it should be a thousand.

The sulphuret ores are fed to a Bruckner furnace, roasted and chloridized and then added to the other ores. The product is run out in silver bullion, carrying a fair per cent of gold. The mill was first operated wet. This failed and then the present Nevada system of treatment was adopted. It would look, however, as though the surface ores could be worked to a better advantage if they were treated as at the Anaconda mine in Montana and converted into copper matte. The Iron Mountain mine is one that the owners and the county can well be proud of, and if it were thoroughly developed and equipped, I very much doubt if any mine could excel it in the value and amount of its output.

Mining Information.

In my trip up through Tuolumne, Calaveras, Amador, El Dorado, Placer, Nevada, Sierra, Plumas, Lassen and Shasta counties, I have met with the kind, courteous treatment characteristic of mining men, and I have been

pleased to find that there is no longer any hidden or secret business. Mining has long been handicapped by the refusal of the owners of good mines to give any information in regard to their properties, and in consequence the public has only learned of the "wildcat" or worthless class of mines. That day has passed and mining men everywhere recognize the fact that the business of mining needs but to be placed before the people in its true light to place it where it belongs—in the front rank of all legitimate and profitable business enterprises.

That quartz mining is coming to the front is shown by the general reopening of old mines and the development of new. Capital is constantly on the lookout for a good mine, and the miner has but to show the ore in sight to get its full value. I desire to return my most sincere thanks to all who have so kindly assisted me in my work and to assure them that if I can serve them in any capacity, they have but to address

E. H. SCHAEFFLE,
Murphys Cal. Ex. U. S. M. E.

The Phonograph.

A Theory of Sound and Vibrations.

EDITORS PRESS:—Much has been written in explanation of this mysterious instrument for the repetition of sound, but a proper investigation of its operation justifies the conclusion that the true explanation of its mysterious operation has never as yet (to my knowledge) been given, and since sound plays the most important part in its operation, it becomes necessary for a proper understanding of it therefore to have some idea of the nature of sound. This phenomenon, with which all are familiar, is that peculiar sensation which the mind experiences when substance is caused to vibrate, or, in other words, sound is an effect of the vibration of the atoms of substance.

For instance, when the atoms of any substance are put into motion, or are caused to vibrate, the atoms of the air in immediate contact with such vibrating substance are put into a corresponding vibration, and being conveyed to the brain, its substance is also caused to vibrate in a corresponding manner, and the mind (?) forms the conception of a sound produced by such vibrating substances.

But now arises the very important question, viz.: Does a sound proceed from the vibrating substance, or does the mind receive an impression only of the peculiar sensation as an effect of such vibration? If the former is the case, then we must conclude that sound is a substance, or a something contained in all things, and that it is thrown out or set free when substances are put into vibration. For instance, we play upon a musical instrument, as the violin, the strings of which are caused to vibrate, and we receive upon the mind an impression of a sound, which seems to proceed directly from the instrument; but does it? Does this something, termed sound, exist within the instrument, independent of vibration, or is it a property of matter and an effect of vibration? And when the vibration is conveyed to the brain, what gives to the mind the impression of a sound, the latter as a tangible reality having been first impressed upon the brain, or is it simply the vibration?

Now the true answer to these questions has never been satisfactorily given, for the want of sufficient evidence by which to form a proper conception of the phenomenon.

But fortunately, owing to the recent discovery by Mr. Edison of the phonograph, we are enabled by its mysterious operation in the repetition of sound to comprehend the true nature of the latter phenomenon. Again, since sound as before explained, is an effect of the vibration of substance, it is necessary, therefore, to explain the meaning or nature of vibration and the manner in which the mind is enabled to receive the impression of sound as an effect of such vibration. It is, of course, evident that vibration in effect consists in putting into motion the atoms of matter by the contact of two or more substances; when, therefore, such motion is produced in any substance, the atoms of the atmosphere immediately in contact with such vibrating substance are put into a corresponding motion or vibration, and in this manner, from atom to atom the vibration is conveyed to the mind.

An illustration of the manner in which sound or vibration is conducted from the vibrating substance, can be made with a number of balls suspended from a wire. If, for instance, we strike the first ball in the line, the motion imparted to it is immediately imparted to the next following, and in this manner by contact from ball to ball adjacent, the original motion is conveyed the length of the line and the ear at the opposite end will be made conscious of the sound produced by the blow upon the first ball, all of them, however, returning to their original position in line.

From such illustration it is evident that nothing proceeds from a vibrating substance to the ear, but like the balls, the atoms of the air, although put into motion, yet retain their relative position and do not travel onward in order to convey the original vibration. This fact we can also illustrate by the swell of the ocean, which is the vibration of water put into motion by the earth's rotation or by the winds, and although the huge billows seem to be rolling onward, yet by observation we find they do not, but that the water simply rises and falls. Or again, we drop a pebble into the water,

and from this point a continual series of ripples will proceed in a circular form, and expanding in all directions, and the ear placed within the radius of such vibrating ripples, will hear the sound of the falling stone. It will be found upon examination, however, that the water which forms these small waves does not move onward as it appears to do, but in a similar manner as the billows of the ocean, simply rises and falls.

Now, what is true of the wave of vibration in the water is true also of the atmosphere, and for each reason it is evident that no sound wave proceeds from a vibrating substance, but such vibrations are conveyed by contact of atom to atom in a similar manner as illustrated by the ripples of the water.

From the foregoing explanations of the nature of vibration, we can now form some idea of the mysterious operation of the phonograph and of the reproduction of recorded sounds. This is an instrument by the means of which we are enabled to store up for future use the vibrations of substance, and by the repetition of such vibrations to reproduce upon the mind a conception of the original sounds produced by them. All are of course familiar with the fact that there are many methods of storing force or energy. For instance, the elevation of water to a given height, and which is allowed to fall by gravity for use is an illustration of stored energy; so also is the force required in winding a watch spring, the force or energy required in winding it being stored within the spring and ready for use. Another illustration of stored vibration or of energy we find in the impression conveyed to the mind by the use of language in the expression of our ideas, when, for instance, we listen to the conversation of another, the vibration, or what may be termed the sound waves—the effects of the vibration of the vocal organs in speaking—are impressed upon the brain, and the mind is made conscious of the ideas expressed by the use of the words used for the purpose. We find that at some future time the brain matter can be put into vibration in a similar manner and the original idea is again suggested to the mind, and as a repetition of the original idea expressed. This fact we understand constitutes the faculty of memory or of recalling past scenes, events, etc. But between the operation of the phonograph and the human brain, in the manner in which it repeats previous impressions, there is a wide difference, for while the latter simply recalls again to mind the thoughts or ideas only, the former recalls not only the ideas, but repeats also, in an audible tone, the words used in the expression of such ideas.

This discovery of Edison's was the first to illustrate the possibility of storing the energy of vibration and of reproducing its effects subsequently, at pleasure; it was not therefore a discovery of some new law or principle in nature, previously unknown, but new only in its application. Now, to an observer who may be perhaps familiar with and who understands the nature of sound and how it is produced, as we have all been taught to believe, it seems but natural, and in fact, to him, as a matter of course, without question, that when the vibrations of the vocal organs, as, for instance, in speaking before the phonograph, are impressed upon the sensitive cylinder of the instrument, when these recorded impressions are again reproduced, a repetition of the original sounds as spoken must, from the nature of things, be produced as the result. As a matter of fact, such is the case, but not, as is generally supposed, from the simple fact that the sounds were previously impressed upon the cylinder, for the principle involved is an effect of a fundamental law, underlying much of the phenomenon of nature, which is as yet but little understood, or at least recognized, and it is this principle which gives to the phonograph its great mystery, that is, in apparently recording a sound and again repeating it when no sound whatever had been conveyed to or recorded upon it.

From such explanations, it is evident that no sound whatever is produced by the vibrations of substances or from the vocal organs when speaking; consequently the vibrations only of the vocal organs are conveyed to the instrument, in the manner as before explained, and are impressed upon the cylinder. Upon bringing the fine metallic point again in contact with the cylinder, and upon revolving the latter, the metallic point is again put into a similar vibration, and similar sounds, as originally produced, apparently proceed from the instrument; but if no sound were recorded there, whence comes the apparent sound? This sound is apparent only and not a reality; but the vibration is conveyed to the brain, which is put into a corresponding vibration, and the mind forms the conception of a sound and similar in all respects to the original sound produced when speaking.

What is true of the phonograph is true also with the telephone, for no sound whatever is conducted upon the wire, but the atoms of which it is composed are put into motion by the vibrations of the local organs and conveyed along the wire by the contact of atoms, as before explained, and are in this manner conveyed to the receiver at the other extremity, who apparently hears the voice of the sender of the message, but whose mind, however, in reality forms a conception only of the voice speaking, as an effect of the vibration.

It may seem to be the greatest absurdity to maintain that sound is not a tangible reality, but that it is a mental phenomenon only—a conception of the mind, for upon such a suppo-

sition we must assume that previous to the existence of life upon our planet the roar of the surf upon the rocky beach, the thunders reverberating among the clouds above, as well as the clash of worlds in the celestial regions above, were followed only with eternal silence. Yet, absurd as it may seem, and contrary to our previous knowledge of the nature of phenomenon and of nature's forces, we must accept the mysterious phenomenon of the phonograph as an evidence of the fact that no sound whatever proceeds from a vibrating substance, but that it is a conception of the mind only.

But, suggests the reader, "that your theory of sound is wrong, and that it does travel forward upon the telephone wire, is evident from the fact that the receiver of a message is enabled to discriminate between the vibrations of the vocal organs when a person is speaking in the instrument, and the vibrations of any other substance, which he could not do if sound was simply a conception of the mind." It is very true if all vibrations were of similar character the receiver could not discriminate between sounds produced by the vibration of the vocal organs in speaking or the sounds produced by the vibrations of any other substance. For this reason, if an instrument could be constructed to pronounce words in a manner similar as the vocal organs, a receiver could not distinguish them from the human voice, but an instrument of that character cannot be constructed in consequence of the peculiar nature and great number of vibrations necessary to produce the required sounds; or, in other words, that are necessary to enable the human mind to form a conception of the ideas expressed by the vibrations of the vocal organs.

For instance, language by the use of which man is enabled to impart his thoughts or ideas to others, is composed of words arranged in a proper order, while each word is composed of certain letters or symbols, and it is the peculiar vibration of the vocal organs that determines the nature of the letter and its peculiar position for the formation of a word.

Now, upon the inspection of a phonograph cylinder upon which an impression of letters and of words have been previously made, we find that such impressions differ entirely from impressions made by the vibrations of any other substance, for in the case of some simple words the vibrations recorded number many thousands; these peculiar vibrations being imparted to the atoms of the wire, which vibrating in unison, and conveyed through the length of the wire, as before explained, enable the receiver to form a proper conception of the nature of the vibration as well as of the ideas conveyed, and by increasing the velocity of the vibration of the atoms of the medium which convey the message, by the electric battery, these vibrations can be conveyed to any desired distance.

O. W. HASKINS.

Hydraulic Mines in Placer County.

In May last, R. T. Devlin, special counsel for the Sacramento County Supervisors, applied to the Superior Court of Sutter county for a restraining order against hydraulic mining at Iowa Hill and Wisconsin Hill in Placer county, the alluvions from that section emptying into tributaries of the American. The reason for the bringing of the suit in Sutter county was the law passed by the last Legislature that in no case of the kind should plaintiff be heard before a court of the county where plaintiff's residence was claimed or had.

Temporary injunctions were granted against the following companies: Washington Con., Medical Point or Del Rey, Homeward Bound, and Orient. The Circuit Court also enjoined the Golden Hope, Gleason and Orient.

A few weeks ago representatives of the claimants mentioned came down to Sacramento and invited the Board of Supervisors to go up and inspect the mines and view the ground around Iowa Hill and Wisconsin Hill, and asked that the board allow them to run their monitors for a time. There are a number of other claims in the same locality.

The Supervisors went up last week and examined the ground. The attention of the committee was called to the condition of Indian canyon at this point. It could be seen that the bottom had been filled to a great depth with debris from the mines. This they were informed averaged a depth of from 150 feet where it was dumped, gradually decreasing until at the mouth of the canyon, where it emptied into the river, there were no apparent indications whatever of mining having been carried on above.

At the Washington Cone, 20 acres of hedgerock are exposed.

"Now, gentlemen," said W. R. Morton, as reported in the Sacramento News, "I want to call your attention to the material we are working. It is very hard and is worked with great difficulty by the old pick and shovel system. We are barely able to pay expenses in this way, yet it is the only thing left us, and we must either work or starve."

"You see, we are slowly working it out, however, and perhaps in ten or twelve years we could clean up the ground. The result to you valley people would be exactly the same as if we were given permission to operate our monitors, namely, the debris will all find a resting-place in Indian canyon."

"But to us the result would be very different. By operating as we are, we could barely

eke out an existence, but if allowed to hydraulic mine we could clean up with a snug profit, which would to some extent lighten the loss of our pipes, ditches and labor expended for years in perfecting our claims for mining operations."

"Here is the proposition in a nutshell," interposed Mr. Brown. "We ask permission to do in 60 or 90 days what it would require 10 or more years to do, with to you the same result."

After looking the ground over, the canyon where the last debris had been dumped was examined and found to consist of a deep bed of exactly the same material as was found in the mine, except it was freed from the precious metal. This was acknowledged to be a clear demonstration that the cleanup was of such heavy material that a very small per cent of debris could be carried in suspension to the valley below.

A number of other mines were visited and a meeting of the committee was arranged with the representatives of the miners who desired a cleanup. This meeting took place in the evening. We quote the proceeding from the News:

The Washington Consolidated was the first called, and Mr. Sprague, on behalf of his company, asked for the privilege of a 90 days' run. "Will you then etoilete to a perpetual injunction?" said Mr. Devlin.

This was calling for an answer which only a miner who has invested his last dollar in the placers can appreciate.

After a silence, Mr. Sprague answered, "Yes, sir, we will do it."

But this was not the last concession asked by the attorney.

"Will you agree to close your mines perpetually June 1, 1892?" continued Mr. Devlin.

"No," quickly answered Mr. Sprague, "I never could agree to that for the simple reason that it was impossible with the limited water supply to secure water for 90 days."

It was further explained that the material to be removed was of such a nature that it was impossible to use water more than one day in three.

Mr. Morton explained that the strata to be worked would have to be blasted and then broken up with sledges before the monitor would do effective work.

A long altercation followed, Mr. Devlin insisting that the miners should limit themselves in time, or it might take them three years to clean up, and that it threw the matter upon the board in a bad shape. It was thus simply a matter of bookkeeping, and would result in no end of trouble. He believed that the miner's chances of being allowed to run depended upon their fixing a definite date, at which time their mines should close perpetually.

J. L. Brown could not see what difference it would make to the board whether it took ten days or ten years, provided no material other than that stipulated was mined.

"You, Mr. Devlin," said Mr. Brown, "insist upon a proposition which would place us almost in the same position we are now in. Some of our mines will be unable to secure more than ten days' water. You want to make time the essence of the proposition, while we have never made it anything else but the material to be used."

At this point Mr. Bates came to the relief of the miners, stating that he could not see what difference it made as to the time, provided they did not touch any other dirt than that pointed out to the committee.

It was finally agreed that the proposition of each mine should be made without a limiting date, allowing the miners to use water not by consecutive days, but as they were able to secure it, or could use it to advantage.

The Washington Consolidated asked for 90 days' water, 250 inches, at a pressure of 170 feet; the Homeward Bound, 30 days, 300 inches, 150 feet pressure; Del Rey or Medical Point, 90 days, 350 inches, 150 feet pressure; two Gleason mines, 120 days, 280 inches, 200 feet pressure; Sumpter, 100 days, 150 inches of water, pressure 60 feet.

These propositions were taken in writing by Mr. Devlin, after which the meeting adjourned.

"THE EVOLUTION OF ALGEBRA" was the subject of a paper read by Prof. E. W. Hyde at the late meeting of the American Association. He traced the progress of algebra from its rhetorical form in India, Egypt, Arabia and Greece through the encyclopaedia stage of the middle ages, to the modern purely symbolic form. These three stages were explained as being originally mathematical reasoning by words, next by abbreviations, and finally by signs altogether, by which the amazing progress of the past 200 years has been made possible, and the ultimate value of which remains to be determined by its future.

It is probable that the five territories—New Mexico, Utah, Arizona, Oklahoma and Alaska—will make their exhibit of their resources and products under one roof at the World's Fair. They united in a request to that effect and it was granted. Utah, however, wants to make an exhibit by herself if her legislature appropriates enough money to enable her to do so.

A big enterprise is nearing completion near Central Point, Jackson county, Oregon, whereby the Rogue river will be turned into a new channel for a distance of several miles and the bed mined. The ground has been thoroughly prospected and shows up in good shape.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NORTH STAR.—Cor. Amador Ledger, Oct. 3: Since my last quite a ripple of excitement has occurred on account of a change in the condition of the ground at the North Star. In driving in a westerly direction the ground has become softer, the slate is of a lively nature, with about a foot of gouge. This is really the best indication they have had since the prospecting operations commenced.

El Dorado.

HARMON.—El Dorado Republican, Oct. 1: Favorable indications continue to exist at the Harmon mine, where the work of connecting the shaft with the tunnel still goes on. Good rock is found above and below, and if it continues all the way between, the company will have a ledge from 4 to 12 feet wide for a depth of 600 feet to work on, with rock running from \$20 to \$90 per ton. Gold can be seen all through the rock so far uncovered, it is said, and at the bottom of the shaft good rock is still found.

LEAF GOLD.—John Melton was exhibiting a handsome piece of gold in Placerville a few days ago which had just been found on Poverty Point by Frank Rice. Mr. Rice has been engaged for some time in working a piece of ground owned by Mrs. John Hall of this city, and has uncovered some nice little pockets lately. The specimen now owned by Mr. Melton is one of the most beautiful pieces we ever saw. It is much like a fern leaf in outline, is about an inch long, and is very bright, being only stained with iron very slightly in places.

O. K.—Georgetown Gazette, October 1: Dr. Spencer has employed Wm. Gibbs to do some development work on his O. K. Quartz mine near town. The lode was struck in the tunnel last fall, showing good prospects and promise.

DARLING.—The shaft on Darling mine is down 104 feet; at 100 feet two drifts were run on lode—one north 50 feet and one south 50 feet, with favorable results. Work of sinking is progressing. Capt. Newton is doing practical and thorough development work.

TUNNEL.—Mr. Gassman, who has been associated with A. Dow in running a bedrock tunnel in Dow's Cement Hill claim, has drawn out, when John Rich a practical miner who understands the chances for success goes in with Dow to complete the tunnel, which they calculate will tap the gravel inside of 40 feet.

VAN.—Tom Newland arrived last Saturday looking vigorous and cheerful, and resumes charge of the Van mine, which has been idle since last spring, owing to some costly litigation. Mr. Hersey, the millwright, is engaged in putting the machinery in order. He is assisted by Mr. Ascha and the boss. The pump will be working this week and crushing will begin within two weeks. We believe it is the intention to sink for a second level.

Los Angeles.

OIL LANDS.—San Diegoan, Oct. 1: It will be remembered that when Dr. Eames was attending the public meetings and discussing the question of fuel for the iron plant, and for manufacturing generally, some stress was laid upon the fact that the operated territory of the oil lands was in the hands of outside parties, who had the power to exercise arbitrary rates. An important move has just been made by a company largely composed of San Diego citizens, and which promises to materially affect this matter. This company has just effected an organization at Los Angeles under the name of the Banner Oil Co. At the organization, Hon. J. F. Kinney, a resident of the city, was elected president and general manager, W. A. Brophy superintendent, and C. S. Precher secretary. A. L. Hitchcock and W. E. Cooney, also of this city, were elected directors. Three-fourths of the capital stock has already been subscribed. In the way of oil lands, the company has secured about 1600 acres adjoining the Pacific Coast Oil Co.'s land, near Newhall, a short distance north of Los Angeles, and the work of development will begin at once. The oil will be produced chiefly for fuel, and, as a matter of course, San Diego industries will have the first call. From this source the Eames iron plant will get its supply.

Mono.

THE BODIE CON.—Bodie Miner, Oct. 3: During the past week east crosscut No. 1, 700-foot level, was extended 25 feet. East crosscut No. 2, same level, was extended 10 feet. East crosscut from No. 1 south drift, 60 feet above the 700-foot level, was extended 12 feet. South drift, 60 feet above 500-foot level, was extended five feet. There were employed seven miners and one carman, and, jointly with Mono, one engineer, one blacksmith, one carman, one watchman, one foreman, one assayer and carpenter.

THE MONO.—During the past week south drift No. 2, 700-foot level, was extended 19 feet. North drift No. 2, same level, was extended seven feet. East crosscut from above drift was extended 10 feet. There were employed four miners, and, jointly with Bodie, one engineer, one carman, one blacksmith, one watchman, one foreman, one assayer and carpenter.

Nevada.

THE WYOMING IMPROVING.—Grass Valley Union, Sept. 30: The Union of yesterday noticed the unexpected striking of a two-foot ledge in the Wyoming Consolidated ground while a drift was being run to secure air. The first pieces taken out of the vein looked well, but as the vein was opened on deeper, there was a marked improvement in the quartz, as it showed more free-gold heavy sulphurates and plenty of galena—a combination of minerals that is most encouraging with promise for the future of the mine, as it is an assurance that as greater depth is attained the ore will prove richer. The prospect is certainly a splendid one, and the lessees who are opening the mine feel as if they are going to be well compensated for their enterprise.

MACHINERY ARRIVING.—Grass Valley Telegraph, Oct. 6: Some very heavy machinery is being hauled over the narrow-gauge railroad for the W. Y. O. D. quartz mine. It will be but a short time now before the large spur-wheel will be in place, and then all will be ready to run. In the meantime, Supt. Brockington is doing good work underground, and the

mine is looking better than ever, and there is quartz of superior quality in sight to keep the mill going for many months.

Napa.

SHIPMENT OF PRECIOUS METALS.—Independent Calistogian, Oct. 1: Monday afternoon there were shipped from Calistoga to San Francisco by the Palisade Mining Co., whose mine and reduction works are three miles from town, 14,160 ounces of silver and gold, valued at over \$16,000. This amount of metal was obtained from a run of 23 days of only 12 hours each, the company not keeping the reduction works going at night. The shipment of precious metal is only one of many that have been made by the Palisade M. Co. and hence is not considered remarkable here; but it is additional proof that the hills in the vicinity of Calistoga contain silver and gold in quantities that should attract far more attention on the part of mining men than has been noticeable in the past.

SHIPMENTS OF QUICKSILVER.—During the month ending to-day, the following amounts of quicksilver have been received at Calistoga for shipment to San Francisco: Napa Con. mine, 395 flasks; Great Western, 109; Bradford, 79; Sulphur Bk., 97. Total for month, 680 flasks.

Placer.

GRAY EAGLE.—Placer Herald, Oct. 3: Wm. Northwood, of near Forest Hill, made us a pleasant call last Monday. He informs us that the Gray Eagle mine has been troubled considerably with water lately, but they are now putting in new and larger pumps with a capacity sufficient to handle all the water they have or are likely to have.

BONDED.—The Hoagland & Peal quartz mine, about two miles from Emigrant Gap, has been bonded for \$20,000. This mine, we understand, has turned out considerable money and gives promise of proving a big property.

San Diego.

THE STONEWALL IN BONANZA.—San Diego Union, Oct. 1: It was rumored Friday about town that the Stonewall mine was again in bonanza, a large vein of quartz averaging 20 feet in thickness having been discovered in the hanging wall country, about 60 feet from the old workings. The vein was discovered some weeks ago on the 200-foot level, since which time crosscuts from the 100-foot and 300-foot levels have been driven in, discovering the same immense mass of rich gold rock. The shoot is now known to be 200 feet high and may be assumed to be equally long. This would represent at least 60,000 tons of quartz, or sufficient to keep the mills running night and day for three years. If the quartz runs \$20, as stated, the Stonewall is certainly in bonanza. Another story in circulation last evening was that the property had been placed in Chicago for \$1,500,000. Negotiations were begun some time since and have only recently been closed. If these things are true, Julian is on the high road to a prosperity heretofore unknown.

THE BANNER DISTRICT.—San Diego Union, Sept. 1: Deputy Constable Harry Place has returned from an official trip through the Banner mining district and reports business booming in that locality. A number of new claims have been located and rich leads discovered in mines now being worked. The Banner people are confident that their district is as prolific in the precious minerals as any locality in Southern California, and are determined to demonstrate the fact in a practical manner.

REOPENING A MINE.—William A. Roberts, a mining engineer of Los Angeles, who a short time since leased or bonded the Santa Fe mine, owned by Wm. Steel, which is located about seven miles west of Perris, is making preparations to reopen the mine, which years ago produced a large amount of gold, the rock being worked by Mexicans. The remains of upward of 50 arrastras can still be seen near the mine. Mr. Roberts will pump out the mine and continue a new shaft down to an ore shoot known to exist at the north end of the property. The quartz is quite rich in gold and is perfectly free milling.

Shasta.

GLADSTONE.—Shasta Democrat, Oct. 1: Very recently a rich strike was made in the Helena, one of the group of the Gladstone mining property. This property is developing immensely under the able management of Supt. Clark. The Gladstone is now rated as one of the best dividend paying mines on the coast.

Sierra.

WIDE AWAKE.—Mt. Messenger, October 3: The Wide Awake mine is coming out splendidly. Last week it paid \$40 to the pick, and the owners are well satisfied with the appearances for the future. The Extension Co. will open its new hoarding-house at the new tunnel, Sunday. It is reported that gravel paying \$6 to the small carload, has taken from the Thistle shaft.

Sliskiyou.

GRAVEL.—Yreka Journal, October 1: The gravel found in the bottom of the shaft at Yreka Blue Gravel claim, is getting softer and prospects some gold. The shaft is down over 115 feet, and the bedrock certainly cannot be much deeper from the surface. Lee, Lash, & Co., of the Greenhorn Blue Gravel mine have reached the pay channel again from their new shaft, and find exceedingly rich prospects, but the bedrock is much lower, requiring the shaft to be sunk deeper for drainage. They will probably be obliged to go down considerable farther, or to a depth of about 90 feet in order that the steam pump can dispose of the drainage to permit working of the pay channel. The mill of the Mountain Laurel quartz mine, owned by the Ball Bros., has been fixed up in good style by the well known Fort Jones millwright, John Hopper, and is now kept steadily in operation crushing very rich rock from the dumps of the two upper levels. A third tunnel is now being driven, and if the ledge is tapped on this lower level, the mine will be worth a million. The owners have been offered half a million, but wanted \$600,000. The ledge is about 12 feet thick, and of fabulous richness, with quartz enough in sight to last 25 years.

COAL.—The prospecting with diamond drill at Willow Creek, by the Siskiyou Coal Mining Co., has reached a depth of about 200 feet, finding plenty of coal, together with securing an artesian well, raising water some nine or ten feet above the surface. The drill holes an inch hole, and the sheathing is of two inch pipe, hence the larger pipe does not afford as much force to the water as an inch pipe would. The men employed are now

taking out coal and expect to secure a large supply for use in the county and shipping to the surrounding country, as it is claimed to be equal to any of the coal now in use for stove and boiler use. The mine will be worked by running an incline, and hauling the cars out with loads of coal by the use of stationary steam engine upon the cable method. The company expect to be able to furnish coal in large quantity before winter sets in, and believe it will be much cheaper than wood, the price for the coal being placed at \$7 per ton at the mine, a rate about equal to the price paid in New York and other places near coal mining regions.

BEDROCK.—Siskiyou Telegram: G. A. Barr of the Sacramento mine, Willow creek, was in the city this week and informs us that they were now in 185 feet along the bedrock. The rock is perfectly level at present and prospects well, but when they strike the rim, which they daily expect to, they expect to unearth a bonanza. Other parties from Sacramento will arrive in a few days and will push operations vigorously.

COAL.—John Silsby, superintendent of the coal mine on Willow creek, was in the city for a couple of days this week and informs us that they are now running an incline and expect to reach bottom in four or five weeks. They have already four or five feet of coal.

Trinity.

EAST FORK.—Trinity Journal, Oct. 3: H. Junkans, who returned from East Fork Thursday, informs us that the North Star mine is looking very well, but water is a little scarce. They are not able to run the mill to its full capacity for this reason, but are running day and night and doing pretty good work. The Thanksgiving mine looks better than ever, but owing to the fact that some of the rings broke before the new ones arrived, not a great quantity of ore was put through.

PROSPECTS.—There have been several encouraging prospects found on the Lower Trinity and Willow creek. The new finds are in placer diggings and quite a number of Humboldts are interested in them. Development work is now being prosecuted.

Tuolumne.

BONANZA LEASED.—Tuolumne Independent, October 3: The Bonanza mine has been released for a term of three years. M. B. Harriman has secured 3/4 of the lease, and will consequently be king-bee in future operations. The balance of the old partners, J. P. Dart, D. R. Oliver, E. Keil and A. P. Johnson, will probably be permitted to resume old relations, and share in future "good dabs," of which there are doubtless many more left in bank.

NEVADA.

Montgomery District.

THE GOLD MINES.—Cor. Belmont Courier, Oct. 1: The first mine inspected was the Chispa on which three shafts are being sunk and levels run. Shaft No. 1 is down 50 feet and connected with No. 2 by drift. No. 2 is down 100 feet and connected at 50 feet with No. 3 with drift, and a drift is being run at 100 feet also to connect with No. 3. No. 3 is down 70 feet and being pushed as rapidly as possible for a connection on the 100-foot level. In all the workings ordinary shafts and drifts have failed to remove the ledge, and at the station where room was made for windlass, at least 12 feet of ore were taken out and then did not reach the limit. Samples taken across the mine at bottom assayed over \$70. That is above the average claimed for the mine. But they claim an average of over \$20 for the entire mine, which is very flattering, and is one of the finest properties I ever saw. The Second S. W. extension of Chispa has one shaft down 28 feet in good ore and looks fine. The work is being done by McDonald who owns an interest. The Mammoth owned by Roht, Montgomery & Co., has one shaft 50 feet, and drifting and sinking on a good ledge 12 feet wide, all of which prospects well. Two shafts are being sunk on the Wide West mine by Mackay Bros. The ledge is well defined, and prospects and assays with the average of the camp. Shafts 20 feet deep. Two other claims are being worked, but time would not allow a longer stay to see them. All the claims look first class, and snob others will be at work in the camp on at least four other claims. The affairs of the Chispa are at present managed by Wm. Bartlett from Eureka, who has purchased an interest.

Tucacora District.

INDEPENDENCE.—Times-Review, Oct. 2: North shaft sunk two feet, completing the necessary work. ELKO CON.—East crosscut from bottom of incline extended two feet in very hard rock.

COMMONWEALTH.—Second level—North drift from No. 3 chute extended 10 feet in low-grade ore. NEVADA QUEEN.—South drift from second level Commonwealth extended 25 feet, still shows bunches of ore and water coming in the face.

NAVAJO.—The stopes are yielding the usual amount of ore. The pumps are working well and handling the water easily.

NORTH COMMONWEALTH.—Second level—North drift from No. 1 raise has been connected with south drift from joint raise, distance 60 feet. Have started to open up stopes between the two raises.

BELLE ISLE.—No. 2 stopes are yielding the usual amount of good ore, and as soon as the raise in No. 3 is connected with the North Belle Isle drift on the 250-foot level, No. 3 ledge will be ready for stopping. The North Belle Isle crosscut is daily expected to cut No. 3 vein on the 450-foot level, and as soon as this is done, the Belle Isle will drift south on the ore.

NORTH BELLE ISLE.—No. 3 drift from the south line crosscut on the 400-foot level has been extended six feet, all in rich ore of about six inches in thickness. Have commenced cutting out for a winze near the face of No. 3 and will sink to the 450-foot level of the Belle Isle on this rich vein. The upraise from No. 3 has been extended 14 feet and is still showing fine ore; total height, 91 feet and 31 feet yet to go to a connection with the 250-foot level of the Belle Isle. On the 250-foot level of the Belle Isle have started a drift to connect with the top of this raise, and hope to make connection in about ten days. Line crosscut on the 450-foot level of Belle Isle has been extended 28 feet, and it is expected to reach No. 3 vein at any moment. South intermediate above 500-foot level extended eight feet and yielding good ore.

Pioche District.

FIRE.—Pioche Record, Oct. 1: Tuesday morning

at one o'clock a fire alarm sounded by the smelter whistle and the town bell brought out the populace on the double quick to find the surrounding country illuminated by a large fire at the smelter grounds north of town, and the general belief was that the whole plant was going up in smoke. Hastening to the scene, it was found that the assay office was the building undergoing destruction, and that the main works were in no great danger. The loss is something over \$1200, all the scales, etc., and supplies being lost.

FURNACE NOTES.—A stone foundation for a new assay office on the old site is about completed. It took 94,000 bricks to build the smokestack at the new smelter. The addition to the main works on the west side is being extended so as to include a dryer, which has just been erected there. The track at the scales has been raised 18 inches, extending altogether about 150 yards, to make it more nearly level with the ore bins. Buildings are to be brought from Dry Valley to replace the assay office. A second start was made at the furnace last Monday morning, this time with everything in readiness, and with the best results. Three hundred or more bars of bullion have been dipped, and the furnace continues to run smoothly. Work of finishing up the other stack is in progress, and it, too, will be set in operation as soon as ore sufficient for two stacks can be got in, which, however, will not be until the Jack Rabbit road is completed. This will require three weeks time yet. The grade will be finished through by to-morrow night, when it will require 15 days or more to place the rails. Another locomotive has been ordered, one of greater speed and strength than that now in use. It is expected to arrive during the next two weeks.

ARIZONA.

RICH ORE.—Silver Belt, Oct. 1: Chas. Ruckelhausen was in from Quartzite Thursday and brought with him some very rich ore for shipment. His mine is looking well. The production of bullion by the Rescue S. M. Co., for the 12 days ending Sept. 24th, was seven bars of about 80 pounds each; total shipments, 37 bars. A visit to the Rescue mill on Sunday last showed a pleasing condition of activity and success. Under the careful supervision of Paul Johnson, the work of reducing the ore and extracting the precious metal is progressing finely, and about 6000 ounces of silver are produced weekly. There is said to be a splendid showing of ore in the mine. An immense amount of surface work has been performed by the Old Dominion Copper Co. recently. Grading for the new smelting plant has been finished and the cable tramway will soon be stretched. Simon Billing Jr., who was in town a few days since from the Woodville mine, gives a very favorable report of that property. It is producing rich ore in quantity.

COLORADO.

THE GRAND CENTRAL SOLD.—Ass'd Press Dispatch, Oct. 1: The Grand Central mine at Kingstons was sold in Denver last night by Thos. O'Neill, its owner, to an English syndicate for \$1,000,000 cash. It is a low-grade property, running 10 to 20 ounces silver to the ton and 10 per cent lead. It is impossible to give clear titles to property in that locality, so a 99-year lease was given, which is practically a sale. The syndicate will build a 16-mile narrow-gauge road from Lake Valley to the mill to handle the ore. O'Neill goes to London Saturday to dispose of two mines located in the State of Durango, Mex.—the Avence, which has produced \$1,000,000 of silver, and another which has 2,000,000 tons of ore in sight. He will place each one at \$4,000,000.

IDAHO.

ATLANTA AGAIN LOOMING UP.—Elmore Bulletin: Pete Anderson, a gentleman well known on Wood river and Eastern Nevada, came to the Bar from Atlanta last Saturday and dropped into the Bulletin office for a chat. The Lum Burge claim is on an immense ledge, and immediately adjoins the once famous Monarch mine, from which millions of gold and silver was taken years ago. The shaft, recently sunk, is 65 feet in depth, in and surrounded by fair paying ore for the depth of 50 or more feet, at which point rich stringers were encountered. At the 63-foot level a 10-inch vein was found that averages \$2000 in gold to the ton. Here sinking was discontinued and a drift commenced, following the rich vein, which, when Mr. Anderson left the mine, was increasing in quality and thickness, and which it is hoped may lead to a chimney of incalculable wealth. They are assorting the rock and hope to make a small run of the best quality of ore at the Tahoma mill before the season closes. Mr. Anderson brought here several specimens of ore from the Lum Burge that are beauties indeed—being composed mostly of shining gold and black silver. George Tims is diligently prosecuting work on his Jessie Benton mine and with satisfactory results. Colonel Miller has resumed work in the Tahoma mine and is again extracting ore from this old reliable producer. Browne is pushing development work in the Last Chance and getting great encouragement in the shape of rich stringers of ore. Superintendent Oglesby is showing the tunnel toward the Big Lode at good speed, and hopes to tap the ledge before many more weeks shall have passed.

THE FLINT DEAL CONSUMMATED.—De Lamar Nugget, Oct. 1: The Chicago parties who held an option from Mr. Leach on the Flint property were on the ground last week and announced that they would take the property, which will be transferred to them as soon as the papers can be prepared. The price paid is \$500,000. They did not wait to return home before making arrangements for extensive improvements, but wired an order for 20 more stamps, in order to get them running before winter, and have arranged to put more miners on. With the exception of the De Lamar sale, this is the biggest mine deal made in this county for several years. As it follows the resuscitation of a moribund camp, it means more for the mining industries of Owyhee county than any transaction which has taken place in the county for a long time past. The success of working these ores by a cheap process of concentration will put new life in other districts. South Mountain has already felt the effect of this, and properties there have appreciated in value very materially. That dormant district is now being sought after, and a number of capitalists and specu-

ators have already been on the ground and deals are now on the tapis which, if carried through, will revive that camp before winter.

MONTANA

AT BUTTE.—*Inter-Mountain*, Oct. 3: In and about the mines of Butte, there are more men in the employment of large companies and on leases right now than there were five years ago, including the Anaconda group of mines that were in operation at that time. To-day there are big mines in operation that at that time were known only by the location notices. If every idle mine were in full and active operation at this moment, the same complaint of dullness would be heard of among some. The closing down of the Anaconda and Chambers syndicate properties may have retarded the progress of the camp somewhat, but to-day the business of the camp is greater, and more men find employment than when the Anaconda mines were in the full bloom of prosperity.

THE SILVER BOW MINE.—The west shaft of the Silver Bow, No. 1, will be completed in the 700 on or about the 20th of this month. This is one of the big mines of the camp, and it is so known at this time. The hoist is capable of sinking to the 1000 with ease.

THE PARROT COMPANY.—The boys in the Parrot mine are again in their glory, or at least some of them. The large shaft of the old engine, after years of hoisting, has at last given way and parted, and the big engine that was recently put in position will be brought into use by next Monday morning. The cables have arrived and are already on the reel, and the engineers will have to take the next two days in running the cages through the shaft in order to become accustomed to it before Supt. Tibbey will allow a man on the cage. Great care is practiced in this mine, more so than in any other. Drills must be put in cars and not allowed on a cage, rather than the lung ones, and the miner having them must have none other than himself on the cage at the same time. It is prohibited for any one to either go down or come up the shaft with timbers, and it is strictly against the rules for any one to ride upon a loaded car.

THE ANDERSON.—The Butte and Boston Company has leased and bonded the Anderson, that lies between the Northern Pacific side track and the Parrot schoolhouse. This is in a most favorable position, and as an old miner stated, "this whole flat is mineral."

NEW MEXICO.

GOLD HILL.—Silver City *Enterprise*, Oct. 3: J. J. Keister is in from the live little camp of Gold Hill and reports mining interest on the boom in that section since the Reservation has been turning out so well. The Reservation is keeping her record as a producer. C. S. Kellum recently had ten tons of ore worked, which netted \$50 per ton on the plates, besides the concentrates. Dolan & Sullivan have a nice pile of ore on the dump ready to be milled. Their ore has averaged from \$80 to \$100 per ton net. George Hughes has a lot of ore ready for the stamps which will run well. Henry Kule has a fine showing for ore, and has a large amount ready for the mill. Uncle Dave Eggleston is taking out first-class ore, and all his mines are showing up well. Colonel Pritchard is working on the White Signal. J. M. Gaddis is getting his custom mill ready for business. Frank Kennerston has returned from Pyramid and has opened up business at the old stand. The camp is rapidly taking on metropolitan airs.

OUR NEW MINES.—While business is naturally dull everywhere, by reason of money being tied up in transportation of crops, the flourishing state of Grant county, and more especially the mining industry, as evidenced by the many new producing mines opened within the last year, confirms the assertions before made by the *Enterprise* that the mining districts are not half prospected, and the mines already discovered only need development to make them the equal of any in the world.

UTAH.

THE BIG DALY WEST.—*Park Record*: Although ground was only broken on the Daly West property one month ago Thursday, a great deal has been accomplished and the works, under the personal supervision of Mr. J. J. Daly, are rapidly approaching completion. The shaft is going down rapidly, even if hoisting is being done by means of a whim.

THE LUCKY BILL.—The vein encountered in the Lucky Bill about two weeks ago has been drifted upon some 50 feet, and shows a steady improvement as the drift approaches the old shaft. This is strong indication that the ore chute, known to exist in the old workings, goes down and that a mine will be found at no distant day.

THE MORNING STAR.—This property is steadily improving, and at present gives every indication of making for its lessors a handsome bank account. The shaft is now down something over 100 feet, and a crosscut has been run south to the vein, which still shows up good and strong and carrying a splendid grade of ore. The vein in the Morning Star is very strong and carries about 14 inches of fine ore, and gives every indication of becoming larger and better as depth is attained.

CAMP CROSSCUTS.—The raise being made in the Alliance is progressing very favorably and at present gives splendid indications of opening into a body of rich ore. The Union concentrator has not been running at full force this week, owing to some repairs being made. The chief cause of the lay-off has been the placing of a new set of rolls. White & Macdonald have completed their contract on the same piece of work. Operations were begun this week and the contract will be crowded. The Marsac will make no more shipments of sulphides, but the metal will be stored until the refinery is ready for operations, when it will be refined and sent to market. There is quite a large amount of sulphides on hand at the present time, as no shipment has been made for nearly three months. Last week's ore and hulsion shipments from Salt Lake were the largest of any week during the present year. The increase was due to a large shipment of Ontario hulsion. The output from this mine is tremendous when both its ore and hulsion shipments are taken into consideration.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING, Sept. 29, 1891.

- 460,462.—REFLECTING LIGHT—W. J. Burke, Seattle, Wash.
460,198.—CAR COUPLING—M. Clausen, Golden-dale, Wash.
460,429.—INSECT GUARD—S. W. Conrad, Hanford, Cal.
460,430.—WINDMILL—Conrad & Lake, Hanford, Cal.
460,177.—BUILDING BLOCKS—Jerry Cook, Monterey, Cal.
460,371.—WAVE POWER—J. M. Dyer, S. F.
460,127.—WOOD-TURNING LATHE—S. N. Goldy, S. F.
460,230.—PIPE WRENCH—G. Gunnarsson, S. F.
460,390.—WATER MOTOR—W. B. Higgins, S. F.
460,444.—REAMER—W. W. McGregory, Pasadena, Cal.
460,395.—HAT-PRESSING MACHINE—M. Mellitzer, S. F.
460,212.—SICKLE GRINDER—E. D. Middlekauf, Stockton, Cal.
460,183.—VEHICLE WHEEL—H. Rohrer, San Diego, Cal.
460,184.—WAGON TIRE—H. Rohrer, San Diego, Cal.
460,365.—STILL—C. L. Schaltz, S. F.
460,223.—PUMP—C. P. Smith, S. F.
460,227.—INSECTICIDE—R. Wheeler, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WAVE POWER.—James M. Dyer, S. F., assignor of one-fourth to Agostino Sciaroni, Newtown, Cal. No. 460,371. Dated Sept. 29, 1891. This is a novel means for applying the motion and force of the waves, and in transmitting this motion and converting it into a rotary motion which can be applied to machinery for various purposes. One way of applying the force is this: A float to rise and fall with the motion of the waves is attached to hawsers near the center so that the float will stand in a line with the line of movement of the waves. This float is of such a length that one end will be raised by the wave, while the other sinks into a depression between the two adjacent waves, and in this way the float will be caused to oscillate, each end alternately rising and falling as the waves pass beneath it. A framework attached to the float extends transversely across the points where the waves pass beneath it. The ropes pass around drums which are mounted upon a shaft, turning loosely on the shaft and having a pawl and ratchet mechanism, the ratchet being secured to the shaft, and the pawls pivoted to the sides of the drums. The ends of the ropes, after passing around the pulleys, are attached to the weights, which will always exert a tension on the ropes to cause them to move around the pulleys, when the strain which is brought upon them by the float is removed.

In another form the float is connected directly to the framework and this framework is pivoted or fulcrumed to a piling or structure which is permanently fixed at such a point that the float will lie upon and be actuated by the waves, and will transmit its motion through the oscillation of the framework. In this case the ropes extend from the ends of the timbers of the frame, which are at right angles with each other and pass around the drums and operate in the same manner as first described. The alternate oscillations of the framework act to give the shaft nearly or quite a continuous motion. By the application of a sufficiently heavy fly wheel the inventor is of the opinion that the motion could be kept up during the slight intervals between the oscillations of the ends of the float and the ends of the attached framework to which the ropes are attached. The pawl and ratchet, of course, only allow the shaft to rotate in one direction.

PUMP.—Clayton P. Smith, S. F., assignor to the American Pump Manufacturing Co. of California. No. 460,223. Dated Sept. 29, 1891. The object of this invention is to provide float or hingeless valves with a free opening for the passage of liquids or fluids which are to be pumped, and a means for guiding and controlling the movements of the valves. The valve is simply a round disk which, when closed, fits closely upon the flange around the inner passage, and when it is opened by the inward flow of the material caused by the rise of the piston, it is only checked by its contact with certain pins or lugs. When the valve commences to rise, the rear edge of it will come in contact with the lower pin or lug and the other edge continues to rise until the valve stands at an angle within the passage, this opposite edge being checked by another pin higher up. There are no hinge-pin or journals and the valve is perfectly free to turn about and change its position, so there will be no more wear upon one part than another. Several other means of accomplishing the object are shown in the patent. These valves are particularly effective in pumping thick or heavy liquids.

STILL.—Carl L. Schaltz, S. F. No. 460,365. Dated Sept. 29, 1891. This invention relates to certain improvements in distilling apparatus, such as is employed for the extraction of brandy or alcoholic products from wine or other material containing it; and it consists in certain attachments to the still, whereby the wine or other liquid may be deprived of the aldehydes and other ethereal and objectionable substances which are usually carried over with the brandy, or other distillate, and which are injurious thereto. It also consists in an attachment by

which the inventor is enabled to determine what proportion, if any, of alcohol remains in the residue which is discharged from the still.

BUILDING BLOCK.—Jerry Cook, Monterey. No. 460,177. Dated Sept. 29, 1891. This is a hollow building block provided with parallel ribs upon the bottom, inside of the sides thereof, end portions having corresponding grooves or channels, one of said ends having a dovetailed rib and the other a corresponding slot, and the transverse partition joining the sides between the ends. The block or brick is made of any desirable size and of any material which has sufficient strength to prevent the projecting locking lugs or spurs from being broken off in handling. The wall may be made up of these blocks, and by means of the dovetailed grooves and ribs the wall may be laid up very rapidly, and it may have any desirable thickness, the space between the inner and outer blocks which form the wall being left open, and these outer and inner sides may be connected by blocks extending across from side to side and firmly united by means of the dovetailed grooves and ribs at their ends and in the sides of the corresponding blocks of the wall. The wall, being hollow, presents good opportunities for ventilation, and the weight of a wall constructed in this manner will compare favorably with that of a wall composed of solid blocks or other material. The inventor finds that cast iron is a very suitable material for the peculiar building blocks.

INSECTICIDE.—Richard Wheeler, S. F., assignor to L. J. Wheeler and E. H. Gould. No. 460,227. Dated Sept. 29, 1891. This invention relates to an improved insecticide and fungicide, and the preparation thereof, so that it may be transported and stored in solid form, while at the same time being susceptible of solution and reduction to a liquid form when it is to be used. In preparing the compound, the inventor subjects the ingredients to a certain degree of heat for a considerable length of time, so that it may be poured into molds, where it will immediately stiffen and become solid and in a condition for convenient transportation or storage. At the same time it is not so hard as to make it difficult to break up and dissolve, when desired for use.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

Dr.	Cr.	Dr.	Cr.
ARIZONA MINES.	Gould & Curry...	\$10,431	
Crocker.....	Dr. Or. Hale & Norcross...	\$54,128	9,258
Locomotive.....	\$ 912 Julia.....		2,240
Peer.....	361 Justice.....		3,381
Peerless.....	1,143 Kentucky.....		13,281
Silver King.....	Lady Washington.....		13,076
Wells.....	3,093 Mexico.....		18,942
BODIE MINES.	Occidental.....		25,441
Bodie.....	Ophir.....		57,247
Bulwer.....	Overman.....		16,611
Monroe.....	5,253 Potosi.....		15,988
Standard.....	398 Sierra Nevada.....		3,827
Syndicate.....	34,673 Seg. Belcher.....		2,776
2,636 Occipion.....			2,129
2,448 Silver Hill.....			5,533
ALFA.....	7,448 Silver Hill.....		4,441
Andes.....	1,700 Union.....		2,249
Belcher.....	14,857 Utah.....		2,249
Benton.....	19,440 TUSCARORA MINES.		
Best & Belcher.....	76,536 Belle Isle.....		5,536
Bullion.....	3,947 Nevada.....		13,826
Caledonia.....	27,410 Del Monte.....		6,214
Challenge.....	13,149 Diana.....		6,214
Chollar.....	7,007 Grand Prize.....		618
Confidence.....	32,732 Independence.....		17,065
Con. Cal. & Va.....	11,828 Nevada.....		14,640
Con. Imperial.....	12,381 Nevada Queen.....		34,698
Con. New York.....	19,680 North Belle Isle.....		7,924
Crown Point.....	354 N. Commonwealth.....		15,000
Exchequer.....	6,810 MISCELLANEOUS MINES		
518 Sierra Nev.....	19,628 Europa.....		32,621
	718 Holmes.....		42,816

Holmes has unsold bullion amounting to 8795 ounces. Occidental has bullion amounting to \$540,89. Con. Cal. & Va. has bullion on hand amounting to \$25,039.01, with further shipments to arrive. Nevada has \$12,800 due on pumping account. North Belle Isle has \$344.80 due. Del Monte has \$1312.50 due. North Commonwealth has \$1312.50 due.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

WILDERNESS G. M. Co., Oct. 2. Capital Stock, \$5,000,000. Directors—A. J. McGovern, J. W. Smith, C. K. King, E. M. Gibson and E. W. Woodward.

CONSUMERS FUEL, FEED AND TEAMING CO., Oct. 5. Capital Stock, \$50,000. Directors—Hugh Flynn, F. F. Latson, Geo. H. Hunt, F. H. Ellis and John L. Howard.

MEXICAN IMPORTING CO., Oct. 7. Capital Stock, \$1,000,000. Directors—A. C. Williams, C. F. Low, E. G. Morales, W. N. Dimmick, B. B. Williams, A. G. Eels and S. S. Mackenzie.

PRENTISS CO., Oct. 8. Object, to deal in real estate. Capital Stock, \$5,000. Directors—A. L. Stone, J. W. Young, C. W. Prentiss and H. T. Mayo.

TEPEZELA M. Co., Sept. 29. Location, Mexico. Capital stock, \$10,000,000. Directors—J. L. Rathbone, Geo. E. Ames, Geo. F. Beveridge, Anthony Bray and J. W. Pew.

EAGLE FISHING CO., Sept. 29. Capital stock, \$200,000. Directors—C. W. Preiss, Chas. A. Wagner, L. M. Furman, J. H. C. Prien and Louis Schmidt.

WORLD'S FAIR TRANSPORTATION CO., Sept. 30. Object, to furnish transportation from California to Chicago and back during the World's Fair in 1893, and also hotel, living and other accommodations at Chicago. Capital stock, \$1,000,000. Directors—John P. Irish, S. G. Haversole, T. B. H. Stenhouse, John Conley, W. H. Quinn, A. S. Keal, J. E. Shawhan Jr., C. Hanlon, J. W. Collins, A. Godhe and G. B. Warren.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

R. C. HOAG—San Francisco.
J. G. BAILEY—San Francisco.
F. K. MERRITT—San Francisco.
J. T. AUSTIN—Frisco, Cal.
Geo. WILSON—Sacramento, Cal.
J. H. CROSSMAN—Perris, Cal.
CHAUNCEY A. DAYTON—San Lucas, Cal.
G. R. GILL—Cambridge, Cal.
WM. T. HALL—Cloverdale.

Mining Share Market.

Mining shares the past week gravitated under cross-orders to lower figures up to Monday afternoon when, after cleaning the market of all stocks on a margin that it was possible, a firmer tone set in resulting with a sharp advance the next day of from 10 to 20 per cent. The rise brought in more sellers, and to accommodate legitimate sellers lower prices were quoted. The lowering of quotations through cross-orders had a stimulating effect on outside sellers, who parted quite freely with the few shares they saw a profit in. The market acts very decidedly as if the pool was going to force some of the shorts to fill, after which break prices at such a break-neck speed it will be quite impossible for the larger short sellers putting out stocks at the advance. There is no use of attempting to deny that the confidence in the honesty of the mine managers is totally destroyed, and under this condition it is hard to get in buyers on a raise. The few of the chronic traders have been taught to take their profit whenever it appears in sight; it is only by such a course they are able to keep even. The outside feeling is well illustrated in an editorial in the last issue of the *Independent Callistogian*, from which we excerpt the following:

Mining men of California who are competent and possess ample wealth to engage in the work of mining extensively, care very little for a good prospect or mine away from the Comstock lode in Nevada. They are not looking for investments where honest, straightforward transactions are necessary for success. They prefer temporary investment in some incorporated mining company, a majority of whose stock a coterie of these worthies obtain by "hook or crook" at a few cents per share. They then have control, elect themselves—or their dummies, officers—then increase the price of stock by manipulation at the San Francisco Mining Stock Exchange boards, sell their holdings at an advance, then levy an assessment to obtain money to work the mine or mines they control, run prices down, buy their stock back again for a few cents per share, and during these operations escape even the payment of a dollar from their own funds, the general public, the "outsiders," the "lambs" paying all expenses of working the mines. This is repeated year after year, and yet the worst has not been told. These opulent mining men not only do not pay anything for working the mines they control, but they actually steal outright from one-half to all the metal taken from them. These are facts well known to many people, particularly old timers.

Notwithstanding such scorching editorials as the above, which are, without doubt, the reflex of public opinion, the writer believes that the pool, through cross orders or otherwise, will create higher prices, but it is not likely they will be able to sell much, yet by advancing quotations they can make the shorts fill.

The suit of M. W. Fox against the Savage Mining Co. is to come up before Judge Hebbard, New City Hall, on next Tuesday. Interesting developments are looked for. Stockholders who can attend the trial should be on hand.

F. B. Logan, formerly correspondent for this paper and who is considered thoroughly reliable, writes as follows from the Quijota District to the *Arizona Citizen* of a recent date, regarding the mines there. "In 1884 the present owners got possession of the mines and a shipment of 50 or more tons of very rich ore raised an excitement, which brought the rush of people. Nearly 500,000 was extracted from the Peerless and Crocker mines. Mr. Pickett is now laying in the largest amount of supplies ever provided since the palmy days, and is preparing to make another run on the Peerless, and also the Peer, which he believes will prove the best mine in the group. He has assays to justify this conclusion. He proposes to let some large wood contracts soon. Burley drills are being employed to thoroughly prospect the property, and at the same time a small force of men is engaged in stoping, which is soon to be increased, whereupon the mill, which is a 20-stamp, will be started up again.

From the Comstock mines the news continues interesting and important. The west drift in Mexican near the Ophir line, on the 1465 level, is being closely watched, and good results are confidently looked for. From Union and Sierra Nevada nothing new comes to hand. In Con. Virginia the management expects to be able to show up several levels to the west. The work for months past, or since the rich strike on the 800-foot level, has been to get the other levels in good condition for taking out the ore which is known to be very high grade. The only difficulty that now appears to be in the way is the claim of West Con. Virginia to the west ledge. The latter's ground is patented. In Hale & Norcross and also in Savage the developing work is continued. In the former they are raising ore to the surface. The work in Potosi and Bullion, which is being lost sight of, is quite important, as is that in Con. Imperial on the 1100-foot level. A strike in this mine would revive interest in the adjoining mines. They appear to be getting the water down in the south end Gold Hill mines, so that work can be resumed soon on the levels where rich ore is known to be. It will take time to repair and get the old drifts, etc., in shape. When Overman's assessment is delinquent, it will be in order to give out better news from that mine.

From the Tuscarora the news is about as heretofore reported. From the Bodies, news comes to hand that stringers are being cut, and everything points to good results at an early day in one, perhaps two, of the mines. Work is resumed on the 800 level in Bodie.

NEWSPAPER AGENTS WANTED.

Extra inducements will be offered for a few active canvassers who will give their whole attention (for a while at least) to soliciting subscriptions and advertisements for this journal. Apply soon, or address this office, giving address, age, experience and reference. Special inducements to old agents. DEWEY & Co., Publishers, No. 220 Market St., S. F.

DILUTED muriatic acid will take the mddy deposits out of gnage glasses.

MECHANICAL PROGRESS.

Chain Manufacture.

Chain manufacture, on the largest scale, constitutes at present a large portion of the business of the shops at the Charlestown (Massachusetts) Navy Yard. The process is an interesting one, and one that requires the greatest care, both in selecting the material and in the manner of working it up. The rolling mill and forge shops are being worked to their utmost capacity upon the construction of chain and anchors. The Government rejects all outside iron and is making its own, using nothing but the finest of malleable scraps.

Outside the shops lie tons of the old iron which is first sorted and then cut up into small pieces by immense shears, it is then piled upon a flat board in regulation sized heaps which are thrust into a furnace by means of an iron paddle resembling that used by a baker. From this it is withdrawn a glowing mass of white, hot iron, and then rolled into long flat slabs of about one-inch thickness. These are then cut up into short lengths, and of these short slabs piles of fine are made to be again subject to intense heat; these are withdrawn and rolled into billets of a few inches square at the ends and about two feet long; these billets are then thrust into a furnace for the third time, and at a white heat are withdrawn by means of large tongs suspended by a chain from an overhead trolley wheel. They are then rolled quickly into rods of various sizes and a number of feet long, and allowed to cool gradually in the air.

The rods are then cut cold into short lengths for the links, which are formed by again heating and placing upon a special contrivance and turned into a staple shape. The staples are then linked together, completing the chain, and the ends are welded together by hand. The joining piece is then put on, and the link is complete as far as workmanship is concerned. When a certain length of chain has been finished, it is put to a severe test. A long ditch running on one side of the shop is provided at one end with secure fastenings and at the other with a hydraulic engine, by means of which the chain is drawn tight and subjected to so many tons pressure. If it stands the test, all well and good; but if, on the contrary, a link breaks or contains any flaw, it is immediately taken off and a new one substituted, the old one to be again heated and forged. There are orders enough for chain ahead to keep this department in full operation for a year. Two great anchors of 2500 pounds each have just been completed, and a number more, some even larger than these, are in various stages of construction, and orders are coming in continually.

Iron Buildings.

Notwithstanding the great value of iron as a material of construction for certain purposes, we think that in this country, where more iron buildings, perhaps, have been erected than in all other countries put together, there is a strong feeling among architects that they have had their day; and that a better, safer and more durable structure can be made by combining masonry with iron than by using the metal as the only, or even the principal constructive material. In other countries, and especially in France, where iron construction is now applied to all sorts of new uses, it has the charm of novelty, and is often spoken of as the universal material of the future; but most experienced American architects have seen too many iron columns honeycombed with rust, and girders with half the thickness of the webs separating in flakes, to wish to entrust their reputation to such perishable material, while our fire engineers have thoroughly satisfied themselves that an iron building of the ordinary sort is less capable of resisting a severe fire than one of almost any other material. Among the engineers, a similar distrust of iron for construction exposed to the weather has become very general. Two serious accidents have shown that the life of a suspension bridge, with either wire or chain cables, is only about 40 years, and some recent examinations of plate-girder bridges have shown that, in about the same length of time, the web plates, notwithstanding careful and often-repeated painting, are eaten nearly or quite through, by corrosion, which works unobserved beneath the paint. The contrast between bridges which perish in a generation, and those which, like several of the masonry bridges built by the Romans, have been in use for nearly 2000 years, and are still in excellent condition, is too striking not to attract the attention of intelligent engineers, and the next decade is likely to see brick and stone extensively used for railway bridges, to the great advantage of the landscape in the neighborhood. Already, it is said that the officials of the Pennsylvania railroad, which has always led in scientific engineering, have given orders that no more iron bridges shall be built on the road, and the children of the present stockholders will probably have reason to rejoice at the decision.—*American Architect.*

RAPIDLY INCREASING DEMAND FOR IRON.—Iron is rapidly finding its way into new uses and thus, with the constantly increasing demand for its present and past uses, is testing to the utmost the productive capacity of the country in this direction. From its physical quali-

ties, iron is suitable for almost all constructive purposes. In addition to its use for machinery, electrical purposes, fencing and shipbuilding, it is now fast coming into large use for building purposes—dwellings and bridge building. In house building it is largely taking the place of machine woodwork. Wrought and sheet metal and galvanized iron is taking the place of wood for cornices, bay and other windows, stable fittings, vanite, shutters, all styles of heavy and light columns, girders, bolts, roofs, crests, fire escapes, ventilators, chimney caps, etc. In 1878 the demand for iron in the United States was 3,000,000 tons, in 1882, 4,000,000 tons, and this demand has increased until it has reached 8,000,000 tons, and it will therefore be seen that iron and its products have become one of our most important productions, necessitating the improved processes of manufacture which are so rapidly being introduced.

Heating Tire.

A very large majority of blacksmiths adhere to the old idea of heating tire up to a white heat by daylight, and then depending upon a deluge of water to prevent burning the felloe. This, in addition to the damage done to the wood by charring it, is a waste of time and money. The time necessary to heat to this extreme degree will be double what would be required to heat to a degree that would give a better result, without inflicting damage on the wood, and, in addition, consuming double the amount of fuel.

The law of expansion is well understood by engineers. In plain figures, the linear expansion of a bar of iron is about one forty-eighth part of an inch to the foot when the bar is heated up to 600°—a low heat that shows light red in the twilight, but which is imperceptible by full daylight. At this point, the linear expansion of a tire is at its greatest, as above it the transverse expansion or swell equals the increase in the linear expansion.

How low this heat is may be judged when iron at a welding heat is up to 1892°, and the common forge is capable of imparting heat up to 2346°. A tire 14 feet long will expand one-fourth of an inch when heated up to 600°, and about three-sixteenths when heated up to 212°, an expansion exceeding that required for any well-made wheel.

As charcoal ignites at 800°, it is evident that no damage can be done to wood by iron heated to 400° or less. If above 400°, it will char the wood unless cooled quickly by water; but the amount required is so small as not to damage the wood in any way.

If a tire comes loose upon a wheel in a short time after it is set, the wheel-maker is often accused of furnishing an inferior wheel; but if examined it will generally be found that the tire has charred the wood so that it crumbles from constant concussion, or that the felloes around the spoke ends are jammed in. This jamming of the fiber has weakened it, and the constant pounding of the wheel over the roads causes it to relax, and the tire is loosened because of the falling away of the felloe.

Had the tire been heated up to a point that would have set the wood snugly together in all its parts without "draw" enough to cause an extra strain, the solidity of the wood would not have been impaired, and there would have been no loosening of the tire in an unreasonable short time.

The old way of heating by stocking up the tires and building a fire around the pile is an operation that is too antique to be permitted in these days, even in a hack woods district. A man who sets a dozen tins in a year can afford to erect a tin-heating furnace, which can be done by using a few thousand bricks or a few cords of flat stone and a few hours' labor. Once erected it will last for years, and when needed, a few sets or a single tire are to be heated, it can be done in less time than it takes to build a fire around a tire on the ground. The fact that no carriage builder who values his reputation will heat his tire hot enough to burn the wood is of itself sufficient proof that a better result can be attained by a low than by a high degree of heat.—*Blacksmith and Wheelwright.*

STEEL FOR STAY BOLTS.—The announcement has recently been made that steel, as a material for boiler stay bolts, is not meeting with the qualified success that has allowed the introduction of the same metal for the plates of the boilers themselves, more than one large railroad company having abandoned its use after an impartial trial, and returned to some good brand of iron. It is assumed that as long as flat surfaces, stayed transversely by bolts, are employed in boiler work breakages will sometimes occur, the evil being inherent.

A NAPHTHA MOTOR.—A. J. Painter of Pasadena, Cal., has invented a naphtha motor in which the gas is exploded in cylinders by an electric spark from a battery. He thinks the motor can be used in street railway traction.

ARTIFICIAL GRINDSTONES, which outwear by years any natural stone known, are made of a mixture of pulverized quartz, powdered flint, powdered emery or corundum and rubber dissolved by a suitable solvent.

A GUN-HOOP, a hollow forging, weighing 34 tons, is the heaviest single article at the English Royal Naval exhibition.

SCIENTIFIC PROGRESS.

Mind and Matter.

Dr. J. S. Reed, of Trinity church, San Francisco, has recently commenced a series of discourses on "Christianity and Evolution," which are attracting considerable attention. The particular theme of the discourse two weeks since was

Mind and Matter.

Dr. Reed denies that the soul is the result of evolution; but he concedes evolution so far as physical life is concerned. He holds that the mental functions could not have been developed and perfected by the slow process of evolution. "Evolution," he said, "will not concede a special Providence for the creation of the soul, and yet all evolutionists are forced to the conclusion that mind and matter are not identical. In this we can easily detect an inconsistency, for if of different substances they must have had a separate and distinct source of origin. The soul is not the result of evolution from a first principle of physical life, but a creation of God."

In a communication to the *Morning Call* in reply to some comments on his discourse, he says: "What I tried to show was that the latest philosophy had ceased to believe in the supremacy of matter, and that the materialistic scare had had its day. I cited the recent utterances of Tyndall, Huxley, Spencer, to the effect that 'there is behind nature an infinite and eternal energy, from which all things proceed.'"

"I cited the experiments of Pasteur and Tyndall, which have forever discredited the doctrines of spontaneous generation, and endeavored to show that the whole scientific world is convinced that 'life is always the antecedent of life,' and he whom we call God was the originator of that primal cell from which, according to the theory of evolution, all subsequent life has been developed."

"I cited the position of Wallace and Schwann, that some of the great men of science at least still believed in the special creation of the soul."

"I cited the conviction of Tyndall, Darwin, Huxley and Spencer that the soul has been developed out of the original vital spark breathed by the Creator, in the beginning, with a piece of protoplasm."

"I further cited their confessions to the effect that mind and matter are not identical; quoted Spencer's argument to prove the existence of a soul independent of the body; and concluded by dwelling on the thought that, though the doctrine of evolution in its complete form involves the assumption of the growth of the soul along with nature and its gradual emergence into consciousness and thought, it was still possible to be scientific and a believer in the soul's immortality."

"I have not entered upon this course of sermons on 'Christianity and Evolution' without long and careful study, extending through a term of 15 years; nor have I the least intention of using the pulpit to confute scientific heresies. If I can show my congregations that the most modern school of thought has come round to the side of theism, and that even agnosticism has its affirmations, and so establish them in the faith, I shall do all I ever set out to do. I have no controversy with the science of the hour. Rather do I look upon her as the ally of religion; and in every case I desire to cite her 'latest word' on the articles that constitute our creed, assured that, in so doing, I shall be eliciting champions that will slay our doubts and foolish fears."

On the same Sunday, Dr. Robert Mackenzie of the First Presbyterian Church commenced a series of discourses upon substantially the same subject, taking the ground that

Evolution Is the Complement of the Biblical Creation.

He thought there was nothing incompatible with the Christian's theory of the creation and true evolution, one being a continuation of the other in a great measure.

"All truth is one," he said, "whether found in the Bible or in nature. In the one case we have the written page of truth, in the other its illustration. Science has not yet solved the problem of the universe nor is it attempting to do so. The mind of man is like a musical instrument—beyond the end of the scale there is an infinitude of space. Give me a nest of eggs and by means of evolution I will give you chickens in the spring. Evolution does not deal with the origin of life, but confines itself to its development."

"Resolve the world into a chaos of matter, whence came the matter? All things that are have come out of things that have been. All birds came from a nest of eggs, but whence the eggs? Let them come as you please, but whence the first? Evolution does not touch this point, and so cannot interfere with the doctrine of the creation as revealed to us by the Bible."

Electricity and Life.

Mr. Edward P. Jackson has a very suggestive article in the *North American Review*, on "Electricity and Life," from which we extract as follows:

It seems to be a pretty well established fact that electricity may be made at least a powerful stimulant to the growth of plants. May it not be more than a mere stimulant? May it

not be an actual creator of life? Beans, rye, corn, oats, barley, peas, potatoes, sunflowers, clover and flax have all been experimented upon, in some cases with astonishing results. In one series of experiments, the seeds were electrified before they were sown; in another, currents were maintained through the soil in which they were planted; and in still another, through the atmosphere immediately above the plants. In several instances, the yield of fruit was enormously above the average, and in all, the growth was unusually luxuriant. Further experiments are in progress, and it is not unlikely that science is about to add another to her long series of beneficent triumphs, another refutation to the roaking philosophy of Malthe and his disciples.

The results of the experiments have, furthermore, a suggestive bearing upon the relation between electricity and that inscrutable something which we call life. If they do not prove them the same, they at least bring them nearer together than any phenomena which have preceded them. When, in the healing art, enfeebled vitality is restored, either wholly or in part, by the skillful application of electricity, nothing is positively demonstrated beyond mere healthful stimulation, the mere awakening of life which already lay dormant in the system, such as might possibly have followed the use of other remedial agents. But here is not morbid restored to normal conditions, not dormant life reawakened to action. It is apparently the actual development of vitality not preexistent in the perfectly healthy and normal organisms under treatment. Electricity itself appears to be converted to vitality, as elsewhere it is converted to light, heat and mechanical motion.

Whether life can thus not only be renewed, but actually transference into the veins, or rather the nerves, of man, remains for physiological science to determine. It has already been shown that a living body is a species of thermoelectric battery, of which the ectoderm and endoderm are the opposite poles; that the exhilarating effects of a cold plunge, for example, are due simply to the increase of potential from the reduced temperature of the "cold" electrode. But merely setting a battery into operation, or merely increasing its action, is not increasing its inherent voltage, which is what the recent experiments seem to have done for plants.

But do not heat and the active principle of light artificially intensified produce similar effects? The forcing of vegetable growth in hothouses is an old process, not unlike the one in question, both in method and effect. According to the reports given, however, there is a very great difference in the results attained. If this be true, it would seem to indicate more strongly than ever that, of all forms of natural force, electricity bears the closest relation to that mysterious form of it which we call life.

EXCITATION OF MUSCLE BY LIGHT.—To the usual well-known ways of stimulating muscles to contraction, viz., electrical, thermal, mechanical and chemical, M. D'Arsonval has, says *Nature*, recently added that by means of light. He could not, indeed, get any contraction in a fresh frog muscle, when he suddenly threw bright light on it in a dark chamber; but having first in darkness stimulated a muscle with induction currents too weak to give a visible effect, and then suddenly illuminated the muscle with an arc light, the muscle showed slight tremulation. Not thinking this conclusive, however, M. D'Arsonval attached a muscle to the middle of a piece of skin stretched on a funnel, and connected the tube of the funnel by means of a piece of India-rubber tube with the ear. The muscle being now subjected to intense intermittent light, he heard a tone corresponding to the period of illumination, and this ceased when the muscle was killed with heat. Arc light was used, which was concentrated by a lens and passed through an alum solution to stop the heat rays.

STORMS PREDICTED BY TELEPHONES.—The telephone is about to have a new application, namely: That of forecasting storms. A new discovery has been made as to one of the properties of this means of transmitting sound. By placing two iron bars at seven or eight meters distance from each other and then putting them in communication on one side by a copper wire, covered with rubber, and on the other side with a telephone, a storm can, it is said, be predicted at least 12 hours ahead through a dead sound heard in the receiver. According as the storm advances, the sound resembles the heating of ballstones against the windows. Every flash of lightning, and, of course, every clap of thunder that accompanies the storm produces a shock similar to that of a stone cast between the diaphragm and the instrument.—*Cincinnati Commercial.*

TELEPHONIC CHURCH SERVICE. It is said, has proved so successful in Birmingham, England, that it is now proposed to develop the idea by connecting the hospitals with Christ Church, the center of the experiment. Already the wire has been switched on to the bedrooms of sick folk, and with marked success, a flexible cord being attached to the ordinary receiver, with a specially adapted instrument for fixing on the head of the invalid.

RAPID UNDERGROUND TRANSIT FOR BOSTON. Besen Hill, Boston, is about to be explored by diamond drills to ascertain the feasibility and cost of constructing underground railways for rapid transit through that city.

ELECTRICITY.

ELECTRIC LIGHTS FOR CARS.—An Englishman has devised a method of running a dynamo for the electric lighting of railway cars directly from the axle of the car which has heretofore been found to work very successfully, and where the dynamo was dependent upon the locomotive for its power many disadvantages were met with. The following description of the operation of this new method will be found interesting: When the train is at its maximum speed the extra current is fed into an accumulator, and when the speed slackens an extra excitation is given to the main dynamo by a smaller regulating dynamo and the secondary batteries. When the train stops the generating dynamo is automatically switched out of the circuit, and the current fed temporarily from the accumulators alone. By means of a complicated mechanism the electromotive force is kept constant all the time, so that there is no variation in the light, owing to different speeds of the train at different times.

A NEW MODE OF TELEGRAPHY.—It is said that Mr. Preece, the head electrician of the postal telegraph system in England, has succeeded in establishing communication across the Solent to the Isle of Wight, and telegraphed also across the River Severn without using wires, merely using earth plates at a sufficient distance apart. The matter of telegraphing across wide waters and also underground by short lengths of wires with long intervening spaces without wire has long been a matter of study with electricians of advanced thought, and we believe some promising experiments were made several years ago; but, until the above report met our eye, we had thought the matter had been laid to rest as an impossibility. Notwithstanding the extreme probability of reaching success in such a project, it is unsafe in this era of surprises to pronounce anything impossible. Possibly plates instead of wires may lead to the secret of success.

A NON-INDUCTIVE WIRE has been patented and has been put into practicable operation in Boston. The non-induction is accomplished by doing away with ground connections, the line doubling on itself and thus forming a perfect circuit. The outgoing wire is first perfectly insulated, and then wound spirally with a flat steel ribbon, through which the return current passes. The combination is then thoroughly insulated, and the two form a single line or cable from which or to which there is no induction. It is thought that the invention will greatly facilitate ocean telegraphy, as it will certainly avoid the great annoyance met with in city telephone lines, whose great numbers of wires are necessarily strung together on one line of poles, and by reason of which the induction is often so great as to render telephoning almost impossible. We shall allude to this matter more fully at an early day in the future.

ELECTRICAL CONVERSION OF PIG IRON.—Dr. Stephen H. Emmens is reported to have perfected a process for converting pig iron into wrought iron by means of electricity which appears to be a simple elaboration and adaptation of existing modes of electrical deposition. By his method Dr. Emmens claims to be able to produce ductile malleable iron of almost chemical purity from any quality of pig iron. The iron obtained, after washing, heating, and rolling, is said to be equal to the best Swedish brands. The inventor asserts that he can produce wrought iron by this means at a lower cost than by the ordinary puddling process, and that still further economy would result from the use of low grades of pig iron made from ores which are too impure to be treated by the existing mode of conversion.

AN ELECTRIC FLY-CATCHER.—The latest application of electricity is to the destruction of the dipterous pests which form an inseparable adjunct to the summer season. An ingenious inventor, with some knowledge of electricity, has recently constructed a unique electric fly-catcher, consisting of a small induction coil, giving about a quarter-inch spark, with a couple of battery cells, and a series of fine wires strung on a board, similar to a zither. Each alternate wire is connected to a terminal of the coil, and the sliding regulator is so adjusted that the spark will not strike across the metal threads until an unlucky fly alights on one wire, when the projecting body receives a spark and the victim falls between the wires, leaving the field clear for the next comer.

THE HOSKINS MOTOR.—The San Jose *Mercury* of Sept. 30th, says that T. D. Hoskins, the inventor of the motor which is to run on the railway to Alum Rock, states that the long looked-for machine will be in San Jose this week sometime, and that it will be put on the road immediately and kept on. Frank J. Sullivan, one of the projectors of the road, said that the late Mrs. Theresa Fair, who owned a large ranch adjoining the reservation, intended to interest herself in the road. She had an idea of taking up the lease of the reservation with a view of turning it into a fashionable resort, but the decision of the Common Council to prohibit the sale of liquor compelled her to abandon the notion.

THE APPLICATION OF ELECTRICITY IN THE PURIFICATION OF WATER.—Two new meth-

ods of softening water for industrial purposes have been recently proposed by M. Labrowski. One of these involves purely chemical reactions, and need not be noticed here; the other introduces an ingenious application of electricity. Hydrated oxide of lead is placed in a filter press which is traversed by the water to be purified, and this produces an effluent showing only one, or, at most, two degrees of hardness. In this way, all the carbonates, sulphates and chlorides are precipitated. Now, in order to work this process economically, it is necessary to produce the hydrated oxide of lead cheaply. A method has been devised by Villon for this purpose.

TELEPHONING THROUGH ONE'S BODY.—A telephone manager at Youngstown, Ohio, makes this statement: "Did you know that you can talk through a person's body? Well, I have joined the ends of a cut wire long enough for a person to ring up, and afterward held an end in each hand, but far apart, and the two persons could talk just as well through my body as if the lines were connected."

CHEAPENING TELEGRAPHY.—Various devices for increasing the speed and economy of telegraphing have been brought out recently, and it seems not unlikely that a new era of cheap telegraphy is at hand, when companies can send 100 words for 25 cents and make a handsome profit.

THE CALIFORNIA ELECTRICAL WORKS, that has the contract for the Santa Cruz, Garfield Park and the Capitola Electric Street Railroad, are progressing rapidly with the work of setting up the poles and track wires. The road will be ready to operate in November.

SLATE is extensively used for electric switch boards, and although it is liable to fracture, yet an electric construction company recently drilled 12,000 quarter-inch holes in a slab five-eighths of an inch thick and containing but 22 square feet of surface.

AN ELEVATED ELECTRIC ROAD FOR BERLIN.—Berlin is to have the benefit of an elevated railroad, built on the model of those in operation in New York, but Berliners will have the advantage in that the motor power employed here will be electricity.

AN IMMENSE ELECTRIC LAMP.—At the naval exposition in London there is a colossal electric lamp constructed by the admiralty. It gives a light equal to that of 5,000,000 candles, and is placed in a model light-house 56 meters above the ground.

AN INVALID CHAIR, propelled by electricity derived from a storage battery placed underneath the seat, is a late invention. It works to a charm, and one charge of the battery will run the chair for 50 or 60 miles.

The San Jose Electric Road.

The Committee of the Supervisors of San Jose, to which was referred the matter of preparing a draft of a franchise for an electric road, petitioned for by Felix Chappelt and others, from San Jose to the Alameda county line, have reported, and the matter was set for hearing on Tuesday, Oct. 20.

The franchise as reported provides that the gauge shall not exceed 3½ feet; that T steel rails, 35 pounds to the yard, shall be used; that the road may be used for both the transportation of passengers and freight; that freight trains shall run between the hours of 9 P. M. and 5 A. M.; that passenger trains shall run at intervals of not less than an hour between the hours of 7 A. M. and 9 P. M.

The franchise is to continue for 50 years; that the entire road must be completed in two years. The grade must conform to the grade of the traveled roads over which it may pass. The road must be operated at the start by the most improved electric motors, worked by stationary engines; that the overhead system shall be used but that whenever a more improved system of electricity for such road is perfected, the Supervisors may authorize the use of the same at the company's expense.

A speed of 25 miles an hour may be employed on all portions of the road, except in passing through Milpitas, where only 12 miles per hour is to be permitted.

The proposed new road will connect all the towns between Oakland and San Jose that are now isolated from railroads. It is proposed to run cars at least every half hour. It is proposed to make the fare from 25 to 30 per cent cheaper than the present railroad fare. The road, including the two branches, one via Alvarado and one via Warm Springs, will be about 43 miles in length, and will cost from \$450,000 to \$500,000. It is proposed to arrange matters so that the road between Oakland and Hayward can be operated in conjunction with the San Jose road.

Mr. Chappelt states that work will be commenced within 30 days. He estimates that the construction of the road will cost \$6000 a mile.

It is announced that a New York and Boston syndicate has purchased all of the street railways of Detroit for the consideration of something over \$5,000,000. The motive power on all the lines will be changed to electricity. This will throw about 2,300 horses on the market.

It is said that North Carolina is to have one

of the longest electric railways in the world. It is to run from Asheville to Rutherfordton, a distance of 41 miles. The power to operate the road is to be derived from water. The line is intended for both freight and passenger service.

A syndicate has been formed at Cambridge, Mass., to build an electric road between Marlborough and Westborough, Mass. It is the intention to put such a road into active operation at once if the charter can be obtained.

USEFUL INFORMATION.

REPAIRING TERRA COTTA.—On the handling and rehandling of terra cotta of all kinds, it is liable to be chipped or broken, especially on the corners, where it is to be joined to some other piece of architectural design. When this happens, it is best to examine the broken part, and if it has a slant outward or inward, take a sharp chisel and light hammer and make saw-tooth indentures in the sharp part of the break, and then, when it is in position, point up the place with a cement composed as follows: Mix 20 parts clean river sand, two litharge and one of quick-lime into a thin putty with linseed oil; if for red terra cotta, color to the desired shade with venetian red; if buff, with yellow ochre; if brown, with Spanish brown. The cement should be made all at one time, and the pointing up should also be done as to avoid a variety of shades. When this kind of cement is applied to mend broken pieces of terra cotta or to mend broken pieces of stone, as platforms or exterior or interior steps, it acquires after some time a stony hardness.—*The Brickmaker.*

A USELESS KIND OF A FIFTH WHEEL.—A "fifth wheel" is a common expression for uselessness, but "that fifth wheel carried with all army wagons makes me awful tired," said an old man, with a semi-military bearing, as he recently pointed his cane at a picture of an army wagon. During the war I drove a wagon from Paducah to Shiloh, and from there to Atlanta, and then to the sea with Sherman. I hauled one of them fifth wheels all of the way and never found use for it; in fact, I never, in all the four years I was on that trip, heard of a fifth wheel being needed. Some other part of the wagon was sure to break, but a wheel—never. But the Government began to haul a fifth wheel during the Revolutionary War, and is still at it, if that picture correctly represents the army wagon now in use. The practice was introduced by Washington, who lost one of his wagons during the Revolutionary War by the breaking of a wheel. Nobody has since countermanded the order he then issued, although the army has never since lost a wagon in this manner.—*Exchange.*

PREPARED PAPER is still fighting its way and making most remarkable progress in substituting itself for other material in various branches of industry. It is now taking the place of wood in the manufacture of packing cases, and so perfect is the manufacturing process that in many instances nothing but the wonderful differences in weight can afford a clue to the presence of paper in the manufacture. Paper packing cases are indistinguishable, apparently, and the saving they effect in freight is enormous. Thousands of dollars are already invested in this comparatively new industry, and a new company, with \$1,250,000 capital, has been organized to introduce paper boards into other lines. Experiments have been made with huggy wagons and other things where lightness is needed, and paper floorings in lieu of boards will soon be heard of. It is easy to render the material fire-proof in course of its construction, and this is an additional advantage that is highly appreciated.

WOOD WITH A MIRROR POLISH is coming into use for ornamental purposes in Germany in place of metal. The wood is first submitted to a bath of caustic alkali for two or three days at a temperature of about 175° Fahr., then dipped into hydrosulphate of calcium for 24 to 39 hours, after which a concentrated solution of sulphur is added. After another dip in an acetate of lead solution at about 100°, a shining metallic surface is given by polishing when dry with lead, tin or zinc.

SEWING BRASS.—A sewing machine was recently exhibited in Boston, which, it is said, stitched rapidly and easily through leather one-half of an inch thick. Stitches were made evenly and rapidly through a piece of bird's-eye maple three-eighths of an inch thick. As a final test, the machine sewed through a layer of brass one-eighth of an inch thick placed between thin pieces of leather.

PAPER PULP BOBBINS, spool heads, etc., are now made of wood pulp. The advantages of this substance for such purposes are marked, since a bobbin thus made will not split or wear rough, and the yarn will not be likely to be caught and broken. If these bobbins can be manufactured at a reasonable price, it is said that they will practically supersede the old style bobbin.

RAPID LOADING.—The tank steamer Beacon Light, running in the trade of the independent refiners, between New York and European ports, was recently loaded at New York with 1,260,000 gallons of refined oil in 10 hours,

making thereby the quickest time in which a cargo of refined oil has ever been loaded.

TACKS taken from carpets should be well scolded before being used again, as a precaution against the moth.

GOOD MEALTH.

The Apple for Food and Health.

The apple in ancient times was believed to possess great restorative qualities. Chemistry tells us in modern times that this fruit is composed of vegetable fiber, albumen, sugar, gum, chlorophyll, malic acid, lime and much water, says *Field and Farm*. The German analysts declare that the apple contains a larger percentage of phosphorus than any other fruit or vegetable. This phosphorus is admirably adapted for renewing the essential nervous matter, letholone of the brain and spinal cord. Old Scandinavian legends or traditions represent the apple as the food of the gods, who, when they found themselves growing feeble and infirm, resorted to this fruit to renew the powers of the mind and body.

Judging from these traditions, apples must have been highly thought of in ancient times and their restorative qualities understood. The acids of the apple are of great use to people of sedentary habits, whose livers are sluggish of action. They eliminate from the body noxious matters, which, if retarded, would make the brain heavy and dull, or bring out jaundice or skin eruptions, and other allied troubles. Some such experience must have led to the custom of taking apple sauce with roast pork, rich goose and like dishes. The malic acid in ripe apples, either raw or cooked, will neutralize any excess of chalky matter generated by eating too much meat.

It is also a fact that such fresh fruits as the apple, the pear and the plum, taken when ripe without sugar, diminish the acidity of the stomach rather than provoke it. The vegetable salts and juices are converted into alkaline carbonates, which tend to correct acidity. A good, ripe, raw apple is one of the easiest of vegetable substances for the stomach to deal with, the whole process of digestion being complete in 85 minutes. A poultice of rotten apples is said to be an excellent remedy for weak rheumatic eyes. In the French hospitals an apple poultice is applied to lamed eyes, the apple being roasted and the pulp applied directly to the eyes; that is, without the intervention of any cloth or substance. A modern maxim teaches us that "to eat an apple going to bed, the doctor then will hug his head."

A SEA TRIP FOR HEALTH.—When exhaustion has gone so far as to produce a condition of positive breakdown without any special organic lesion a sea trip is in most cases to be preferred to any alternative. The patient has the advantage of perpetual carriage, exercise without the irksomeness of restrained posture and without its limitation to a few hours of sunshine. The chilling effects of night air and alternations of dryness and dampness of atmosphere are almost unknown to sea, and a recovery may in such cases usually be predicated as following almost certainly a few weeks on shipboard. But it is to the middle-aged man more than all others that a holiday at sea is recommended. In the great majority of cases a man who leads an active business or professional life selects his form of holiday as much for what he gets away from as for what he gets to. The desire to get out of harness and to escape from the weary treadmill of the recurring cares, from which few active men are free, is never better met than by a voyage. To such men exercise is a secondary consideration. Fresh air and the incidents that vary the monotony of sea life are sufficient to give all the benefits that any change can give, while the gentle exercise of walking the deck is sufficient to stimulate the appetite and promote digestion. The impossibility of doing anything more energetic than walking the deck is a safeguard to persons of this class; for, after the first flush of youth is over, the sudden transition from a sedentary life to severe exertion is more apt to be attended with risk than with benefit.—*London Medical Recorder.*

A NEW DISINFECTANT.—A recent discovery, which is the outcome of the investigations of Dr. H. Oppermann, and which he has also patented, is the application of dolomite to antiseptics. The dolomite, after a special preparation, is mixed with a certain proportion of oxide of iron and iron pyrites, and the mixture is employed in the form of a powder. According to the experiments made at the Hygienic Institute, at Kiel, it seems likely to substantiate its reported efficacy.

DEATH FROM A STING.—A honey bee's sting has caused the death of a Williamsport (Pa.) man within 15 minutes after its infliction. The physicians who were called were mystified, but expressed the belief that the bee's sting had entered a nerve or blood vessel, and that the poison was quickly carried to the vital organs, causing almost instant paralysis.

A CURIOUS CASE.—Cincinnati physicians are puzzled over the case of a man who, acting as a peace-maker in an affray, was struck on the breast bone and has been dumb ever since. The injuries to his breast have healed, but he is unable to articulate a word.



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SAN FRANCISCO:

Saturday, October 10, 1891.

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Change of Office—Keystone Consolidated Mining Co.
Plans—A. L. Bancroft & Co.
Education—Pacific Engineering School.
Mines Bought and Sold—C. F. Blackhorn & Co., Seattle.
See Advertising Columns.

Passing Events.

It is now pretty well understood that the committee of the Sacramento Supervisors, who visited the hydraulic mines at Iowa Hill, will recommend, and the Supervisors will approve, that the miners be given until the 1st of next June to "clean up." If this is the case, the miners will do as much work as possible this winter.

The coal ships loading at and on the way from Australian ports for this city and San Diego have a registered tonnage of 107,279 tons. Of this, 91,282 tons are for this port. This is the largest coal tonnage ever headed at one time for the California ports.

The shipment of bar silver from Napa Co., noted in our "Mining Summary," is a matter of general interest. It upsets the theory of many mining men that no silver mine of value would be found in the Coast Range. This Napa mine is doing well and sending the pure silver to the Mint in this city, which is the best evidence that there is a producing silver mine close to the coast line.

The success of the Germans in bringing an electrical current to Frankfurt, over 100 miles, with only 25 per cent loss, is suggestive of future benefit to this State when there is abundant water-power. For the mining interests it would be of immense advantage to convey the power for a long distance from stream to mine.

Sampling of Auriferous Concentrates.

The most abundant of all the ores of copper, and the principal product of the Cornish mines in England, is copper pyrites, or yellow copper ore. This ore, when dressed, and in large quantities, generally has a considerable proportion of slimes mixed with it; but even without the slimes, it is exceedingly difficult to obtain by the usual mode of sampling a fair average of it, even when done by those who have had long and practical experience in sampling ore. The difficulty is, however, trifling when compared with that required in the sampling of auriferous concentrates, commonly termed sulphurets, such as we have in California.

Some of the auriferous concentrates have small quantities of telluric gold in them; but as that ore when stamped fine is easily carried away by even a slow current of water, the proportion in the concentrates is generally very limited.

A good "test for tellurium" is as follows: Place in a test tube, or other vessel capable of resisting the action of acids, a small amount of the suspected material, which has been separated as thoroughly as possible from the accompanying gangue. Add enough pure sulphuric acid to well cover the sample and heat to boiling. If tellurium is present, the liquid becomes colored a clear purplish-red.

The gold in the iron pyrites (sulphurets), and also in the arsenical pyrites, exists in a metallic state, the latter having the gold in a coarser condition and in larger quantities.

A microscopic examination of the pyritic matter shows the different forms in which the gold occurs, which is invisible to the naked eye. By the aid of the microscope some of the faces of the crystals of the iron pyrites will be found to be covered or distinctly gilded, and upon dissecting the same crystals the cleavage will also show some gold in one form or another. In the collection made by Melville Atwood Esq., of this city, may be seen some of these gilded crystals and the different forms alluded to.

Now, from the fact that the presence of some of the gold in the pyrites can only be determined by the aid of a microscope, and that only as a fine gilding, some notion may be formed of the excessive fine state of its divisions and how unsatisfactory would be the task of trying to separate such liberated films from water in motion. Some of the finest grains of gold will float in slightly agitated water.

The decomposition of pyritic matter by nitric acid, or the deflagration of it with nitrate of soda is frequently resorted to as a test to show the larger-sized particles of gold and the different forms in which they exist in the pyritic gangue.

The concentrates from the different mills is generally stamped fine enough to pass through a sieve having 25 holes to the linear inch, of which from 40 to 50 per cent will pass through a sieve of 80 holes to the linear inch. The later portions are very rich, the veinstone having been reduced sufficiently fine to rid the gold of the pyritic gangue, which has been washed away.

When the concentrates are from a mill where amalgamation in the battery is the system in use, the frothy amalgam that has not been lost or carried away with the water will be found mixed with the concentrates. Nearly all the gold is in a metallic condition, and in various shapes and sizes, with some amalgam mixed with it and distributed so unevenly in the large piles of concentrates of which it only forms such a very limited part, renders it nearly impossible with the greatest care to obtain anything like a fair sample, so that the reports of the working of the concentrates up to 94 per cent of the gold contents must be taken for what it is worth.

A great deal has been written respecting the Comstock ore, but so far we have not seen any thing published describing the character of the gangue, condition and form of the gold in the Comstock lode, information so necessary and important to those milling the ores. The loss must be something very great, if even a large proportion of the gold is in a pyritic gangue, like that in most of our California gold mines.

CAPT. THOS. E. FRASER who was in charge of the construction of the Lick Observatory, died at Banning, San Bernardino county this week.

Electrical Transmission of Power.

Electrical transmission of power is just now one of the most interesting and important subjects which can engage the attention of engineers. It is very generally recognized as one pregnant with great possibilities. Until quite recently electricity could only be used as a secondary power for steam, at great loss, it at best could only be derived from water power at short distances. But recent experiments in the transmission of the electric current have resulted in most unexpected success. Streams that have hitherto had no pecuniary value are now being employed for producing electricity at great distances from the point of utilization. Notable instances of such enterprises are constantly coming to us from every direction. Long distance installations have become most eminently practicable and economical.

Very important and interesting experiments in this direction have been made in both Germany and France. The most notable of these is the transference in Germany of 300-horse power a distance of 108 miles from the Cement Works of Lauffen to light the electrical exhibition now in progress at Frankfurt. This transmission has been effected by means of high tension alternating currents of the new rotary system. The current is generated at Lauffen in a Brown dynamo, with low tension, then transformed in oil transformers to high tension and conveyed to Frankfurt by three overhead one-eighth inch copper wires, with triple oil insulators. Here it is again transformed to low tension in oil transformers, and the energy used for incandescent lamps and motors. The voltage in the conductors has reached 16,000, and the transferred energy already amounts to 80-horse power and feeds 800 incandescent lamps and a motor which is to drive the pump of an artificial waterfall. The enterprise, which costs \$200,000 works well, and the experiment is proving a great success and of eminent importance to the scientific progress of mankind.

There are several other similar enterprises of importance in Europe to which reference might be made. The success which has attended the long-distance installations in Europe in attracting much attention among electricians in the United States and among other proposed projects is one for transmitting power from Niagara Falls to Chicago during the Columbian exhibition, and making its utilization there one of the chief features of the exhibition. Why not? We do not lack either theory, practical experience or money for such a work. Let our engineers prove that the new world can outdo the old in this latest and grandest of modern inventive progress.

California seems determined to keep fully abreast of the foremost in this work. The immense water power at Folsom, as already noticed in these columns, will probably be the first large movement in this direction. Electricity will be furnished for lights and power to the city of Sacramento, 18 miles distant.

The enterprising people of Fresno are already talking of bringing 100,000-horse power from Millerton to that town by wire, to run machinery, mills, street cars, elevators, etc. There is an abundant supply of water in the foothills that might be thus utilized to furnish most of the power needed all through the San Joaquin valley, from Stockton to Tehachapi. California in the early future, will come well to the front in thus utilizing her water power, which exceeds in volume and convenience any other State in the Union.

Phoenix Converter Plant.

In his description of the progress of production of ingot iron in the converter in Germany, Dr. Wedding, in his paper before the American Institute of Mining Engineers, says: "After de-oxidation and recarbonization in the converter, the iron is lapped into a ladle, which in basic works is attached, as a rule, to a crane carried on a locomotive. The fluid metal is conveyed to another room where it is poured into ingot molds. In some cases these arrangements are impracticable, perhaps because old acid plants have been adapted for the basic process. The latter is the case with the handsome works near Phoenixhutte, near Ruhrort, Rhenish Prussia. There it is necessary to pass the ladle from one crane to another, as shown in the cuts. The crane here serves to bring the liquid pig from

the blast furnace and to receive the ladle containing ingot iron from the converter. The latter ladle is delivered to a second crane, which stands in the center of the casting room.

Washington Iron.

Some considerable interest is being manifested in the iron deposits of this coast at this time. A company has been incorporated at Seattle which proposes to make iron and steel. It has bought 106 acres of land six miles north of the city, within reach of the railroads, the lakes and the Sound. Chief promoter of the enterprise is Col. Ogden Street, for a number of years connected with the Carnegie Iron Works of Pittsburgh and with the furnace-building works of J. P. Witherow of the same city. He also constructed the furnace for the Schofield Furnace Company of Sheffield, Ala.

This gentleman has been in Washington for some months, and says the iron ores of Washington compare favorably with those of Lake Superior. "They are equally as good, the difference being that they are somewhat harder and will require slightly more fuel in working. But when you come to compare the iron ores of the South and Pennsylvania with those of Washington, to use a common expression, 'they are not in it.' In reality, there is no comparison. The coke of Washington is also equal to the celebrated coke of Connellsville. The fact has been demonstrated to my entire satisfaction by Pittsburgh chemists of known reputation. They have made the tests, and they are thorough."

"There is an abundance of ore for the production of the highest quality of steel irons and admixtures descending to the commonest irons of the South. It is the purpose of the company to first erect a blast furnace for the production of pig iron as the basis of other manufacturing enterprises, among which are a pipe foundry for making cast-iron pipe, Bessemer, open hearth and direct steel plants, with accompanying mills for turning out finished products."

"The blast furnace will have a capacity of daily product of 200 tons, or 60,000 tons per year. This means the handling of 750 tons of material daily, in ore, coke and limestone."

A "Poisonous" Spring.

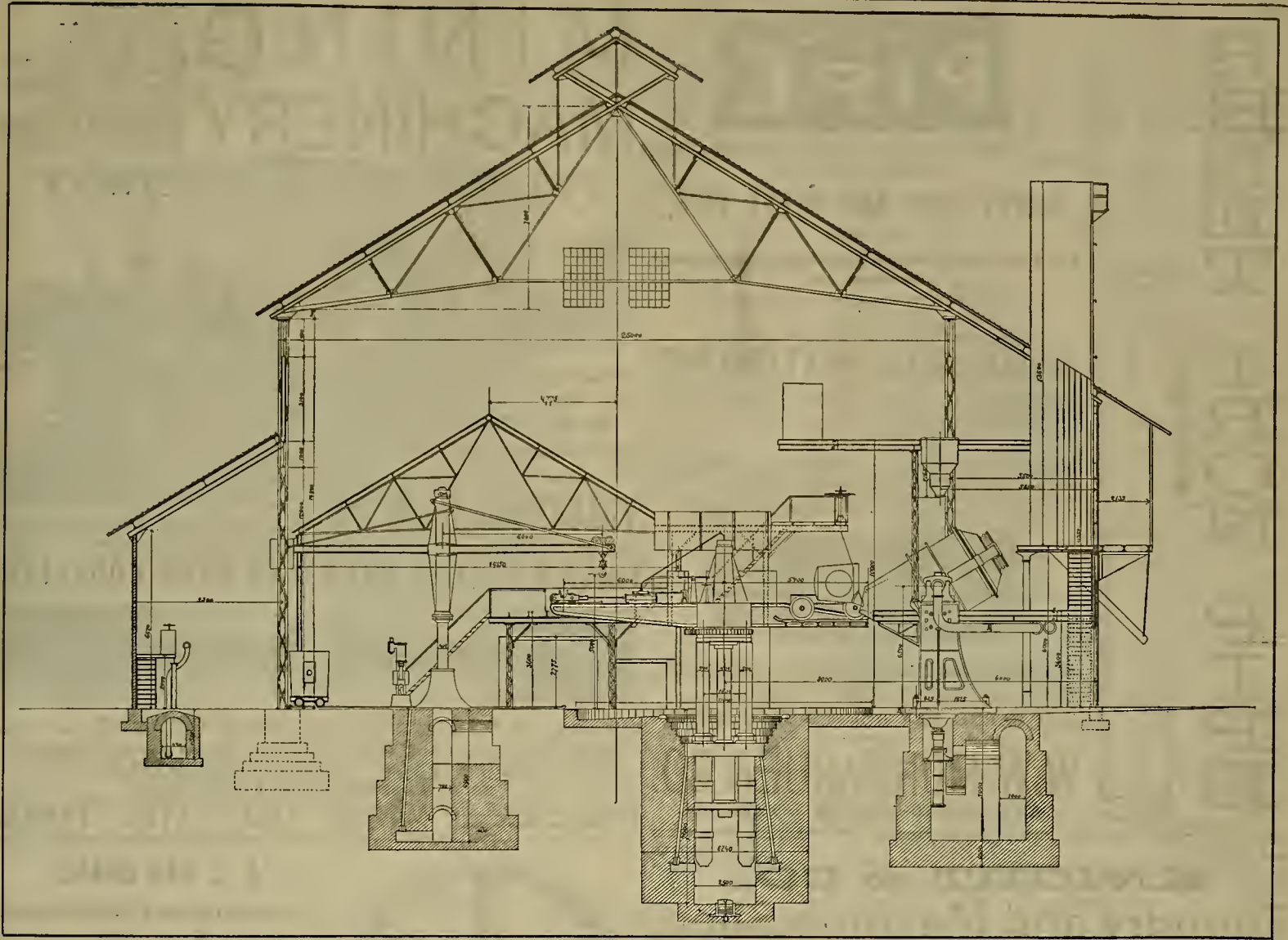
Mr. John T. Evans, the assayer and chemist of this city, who has just returned from a professional visit to Siskiyou county, tells us of a curious "poisonous spring" on Mount Shasta, within about a mile of the snow-belt. It is known as the poisonous spring, because birds, snakes, mice, chipmunks, etc., are killed in numbers when they approach the spot. Yet the water itself is of marvelous purity. An analysis by Mr. Evans shows only $4\frac{1}{2}$ grains of solid matter to the U. S. gallon. The Spring Valley water of this city, which is good and clean contains about 24 grains. A great quantity of carbonic acid gas is given off by the spring and in an area of 15 feet around it. This gas remains close to the ground. A lighted match will burn until within two inches of the surface of the spring on the ground, when it is immediately extinguished. A man or dog is not affected, but small animals or birds, hutterflies, snakes, etc., are suffocated when coming within the area described.

The spring wells up in a little hollow and the gas collects there on a still day. If it were in a cave, it would be just like the famous Grotto del Cane, or cave of the dogs near Naples in Italy, where a man can go in unharmed but a dog, being lower down, is suffocated.

The water in the spring is exceedingly clear, evidently coming from a source in the snows of Mt. Shasta. This water, coming down in some underground channel, must meet a body of carbonic acid gas on its way from the old crater. As the water rises to the surface, there being not enough solid matter to make bicarbonates, the gas is immediately set free. The water itself is pure, and pleasant to the taste.

There is said to be another spring of this kind in Mendocino county. Such springs are, however, rare.

THE Market Street Cable Railway Co., has sued the National Indicator Co. and H. Berryman, its president, for \$919 alleged to be due as rent of the cars for four months, and for the expense incurred in removing the indicators.



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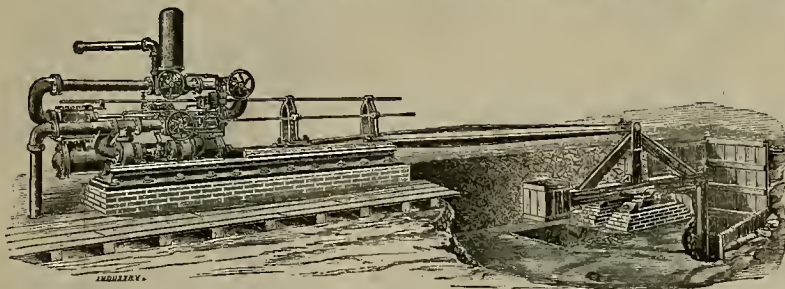
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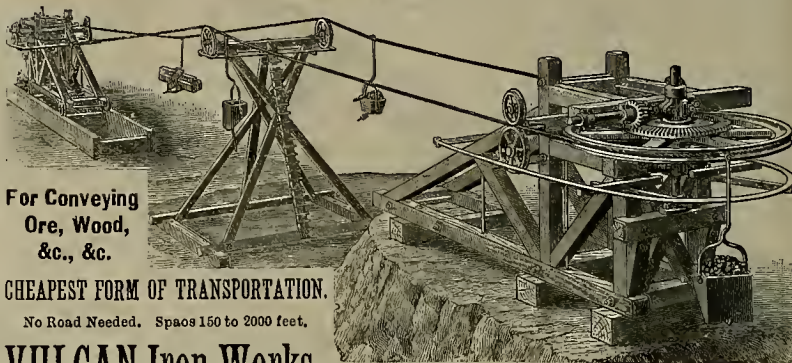
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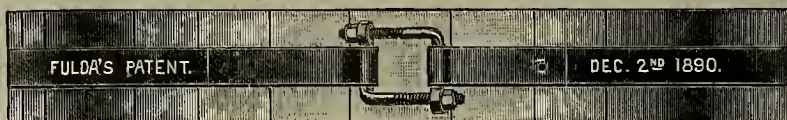
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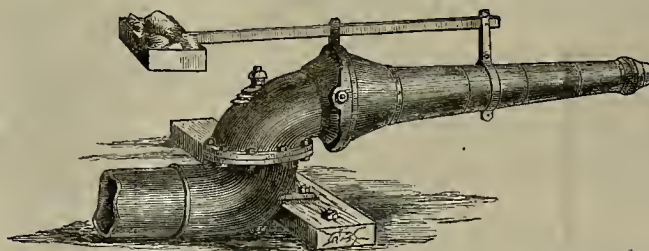
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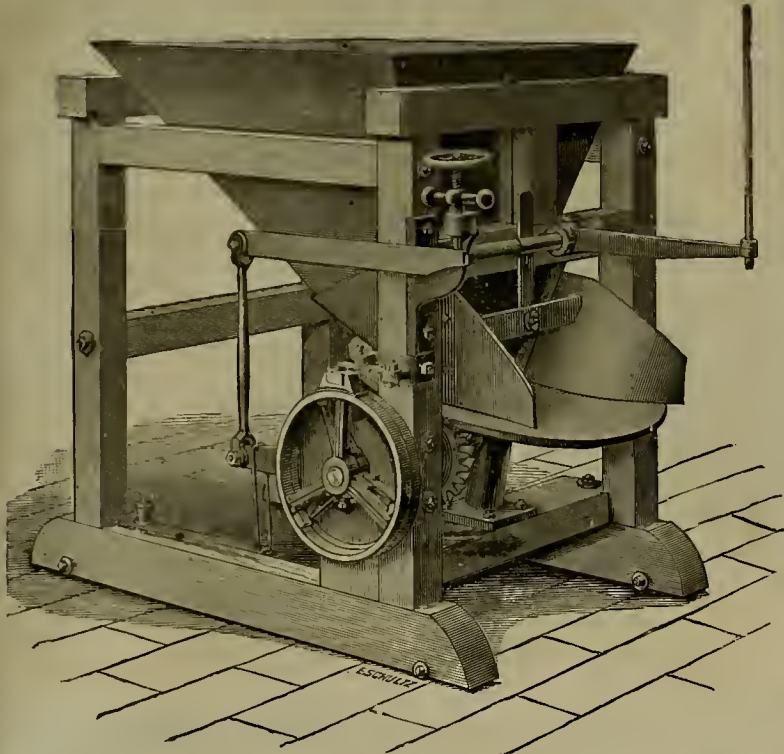
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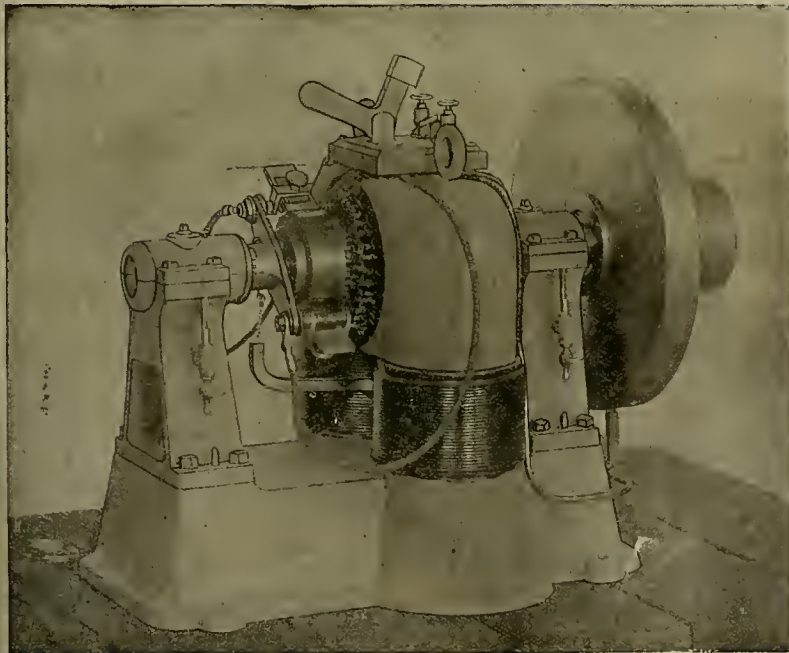
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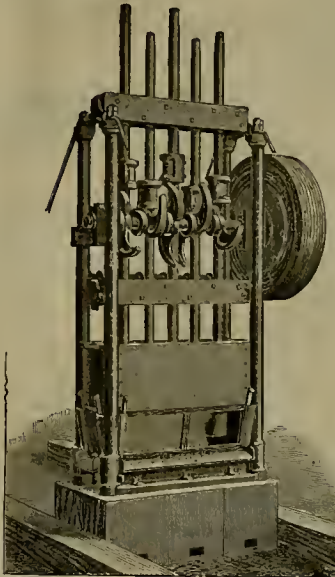
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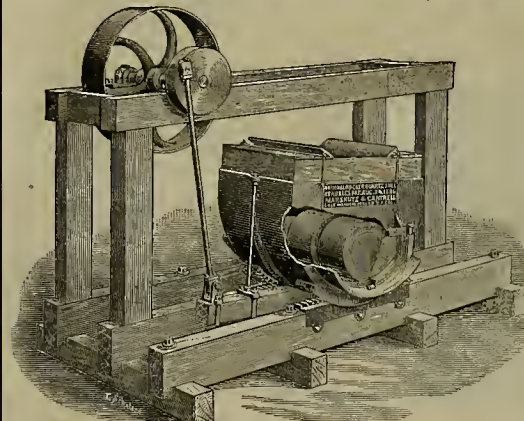
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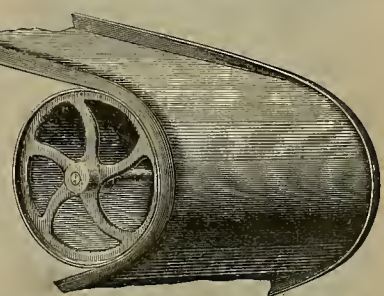
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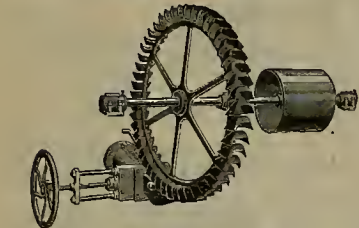
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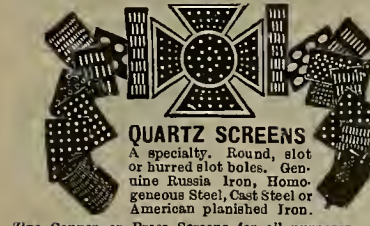
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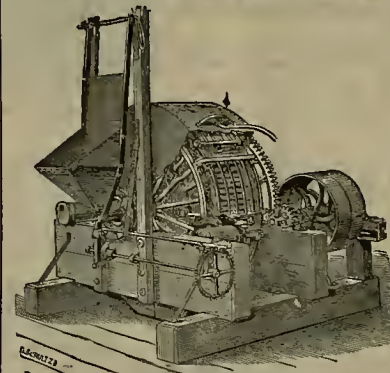
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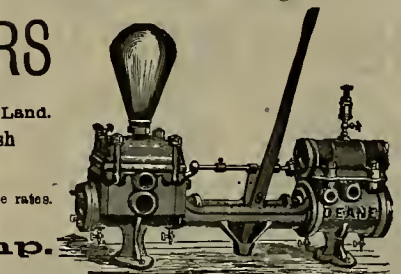
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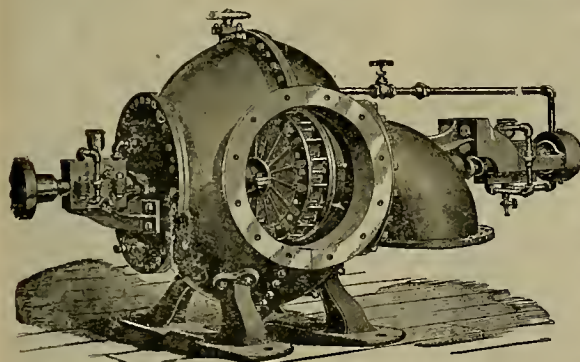
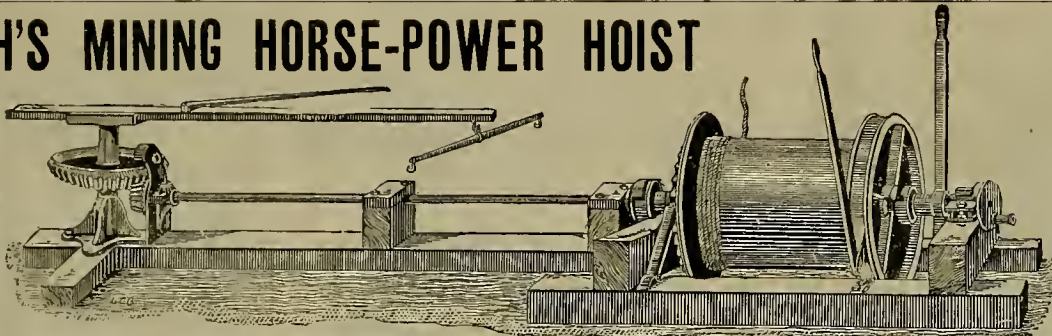
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 8, 1891.

General trade continues active, with all branches participating. How a very prosperous season can be averted it is hard to see, for with unusually large crops in all farm products, and prices, outside of fruit, considerably higher than for several years, money will be in large supply and seeking investment. The ships now on the way have a carrying capacity sufficient to market the remainder of the surplus wheat. The surplus this season represents a cash valuation of fully \$35,000,000. This is a larger sum than the surplus of any one season has been marketed at for several years.

MEXICAN DOLLARS—The market is without essential change. It is quoted at around 77 cents.

QUICKSILVER—Receipts the past week aggregate 270 flasks, and the exports by sea 130 flasks to Mexican ports. For the first nine months of the current year the receipts at this port aggregate 10,513 flasks—an increase of 1245 flasks over 1890—and to exports for the like time 3962 flasks—a decrease of 348 flasks. The market is fairly firm at \$40.50@41.

SILVER—The markets abroad and at the East have fluctuated to lower prices. The decline in the face of all outward conditions being favorable to better prices causes considerable speculation as to the influences at work to bring it about. So far as the writer has been able to learn, no one is able to give an intelligent reason for the weakness. With a good-sized wheat crop in India, and the price much higher, considerably more silver is being sent there in payment for the cereal, yet this and the purchases by the United States have seemingly no favorable effect on the market. The writer holds to the opinion previously expressed that the silver market is being manipulated for speculative purposes. This is the more easily done, owing to the position of the two principal parties at the East on the free coinage of silver.

BORAX—Receipts the past week aggregate 320 cts. The receipts for the first nine months of the current year aggregate 593,300 lbs., against 812,000 lbs. in the like time in 1890. The exports for the first eight months of this year aggregate 82,544 cts., against 70,855 cts. in the like time in 1890.

LIME—Receipts the past week aggregate 3687 bbls. The market is steady, with a fair demand ruling.

TIN—Receipts the past week aggregate 500 boxes plate by rail. The market for both pig and plate is easy. The demand is entirely nominal and to effect sales, concessions are necessary. Both here and at the East the market appears to be of a "waiting" character. Plate on spot in New York can be bought cheaper than "for shipment." English cablegrams report firm holding by makers.

LEAD—The market is reported firm. The consumption has been quite large—larger than in either 1890 or 1889. At the East the market is reported strong at \$4.55, with holders firm in their views.

COPPER—The bark J. D. Peters, hence for New York, took out 391,630 lbs copper matte. The market is strong. The New York market is reported by the *Iron Age*, as follows: In the past week there have been transactions involving upward of 500,000 lbs. Lake Superior product for delivery during the balance of the year at 12½¢, making a total of not less than 15,000,000 lbs sold here during the past fortnight at 12½¢@12½¢. Of that quantity a considerable portion was for electrical purposes, but the purchases by manufacturers of copper and brass goods were of good amount. At present there is a fair demand from the latter interest, but inquiries for cables and bars figure more conspicuously and indicate that the consumption of the metal for electrical purposes is gaining headway. Ingot may be secured at 12½¢ cents, or a shade less, for prompt or near future delivery, in limited quantities, but Cakes and Bars at less than 12½¢ cents for forward shipment are not obtained. Arizona Ingot appears to be rather scarce, with 12 cents a strictly inside price and 12½¢ cents generally asked. For casting brands there is nothing more than a routine demand at present, but the offering is reserved and prices are held at 11½¢@11½¢ cents.

IRON—The market continues easy with large buyers able to get concessions. The quantity being used by iron workers is steadily increasing. The East reports increasing activity and strengthening markets.

COAL—Receipts the past week aggregate as follows: From Departure Bay, 3,995 tons; Carmelo Bay, 250; Seattle, 1840; Baltimore, 3006; Tacoma, 4000. Total, 12,992 tons. The ships on the way from Australian ports to San Francisco have a registered tonnage of 91,282 tons, and on the way to San Diego, 15,997 tons. Total, 107,279 tons, equivalent to a carrying capacity of about 171,600 tons of coal. The coal tonnage on the way from Atlantic and English ports is quite large. The above, in conjunction with the large output of the coast mines, indicate that we will have an abundance of cheap coal this winter, notwithstanding the increased requirements in this State.

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 8.—The following are the closing prices the past week:

	Silver in Silver in	Copper.	Lead.	Tin.
Thursday	46	97½	12 35	4 50
Friday	46	97½	12 35	4 55
Saturday	46	97½	12 30	4 55
Sunday	44 13-16	97	12 30	4 55
Tuesday	44 13-16	96½	12 30	4 55
Wednesday	44 13-16	96½	12 30	4 55

Quicksilver is strong and fairly active at 60c. Copper going into consumption at strong prices. Lead is firm under good demand. Borax is steady at full prices. Tin is barely steady.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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COMPANY AND LOCATION.	NO. AMT. LEVIED, DELINQ. AND SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta M Co., Nevada.	40. 30c. Oct 6, Nov 11, Dec 2.	L Osborn.	309 Montgomery St
Bodie Cons M Co., California.	13. 25c. Sept 22, Nov 5, Dec 9.	H D Walker.	309 Montgomery St
Bruswick Cons M Co., California.	2. 25c. Sept 11, Oct 8, Nov 15.	J Stadfield, Jr.	309 Montgomery St
California & Arizona M Co., Arizona.	2. 10c. Sept 2, Nov 30.	T E Jewell.	310 Pine St
Cop New York M Co., Nevada.	6. 15c. Sept 23, Nov 2, Nov 30.	O E Elliott.	309 Montgomery St
Cons S. G. third M Co., California.	3. 5c. Sept 10, Oct 10, Oct 31.	T Wetzel.	320 Sansome St
De Monte M Co., Nevada.	5. 10c. Sept 28, Nov 3, Nov 30.	J W Pew.	310 Pine St
Gray Eagle M Co., California.	10c. Sept 27, Nov 17.	J N Thayer.	628 Montgomery St
Gravel M Co., California.	4. 10c. Sept 14, Oct 14, Oct 25.	A W Barrows.	303 California St
Iuyo Marble Co., California.	14. 10c. Aug 21, Oct 5, Oct 23.	G W Luce.	137 Montgomery St
Keystone Cons M Co., California.	1. 25c. Sept 6, Oct 21, Nov 23.	J H Isham.	310 Pine St
Kingman M Co., Arizona.	1. 5c. Sept 30, Oct 12, Dec 1.	T E Atkinson.	412 Montgomery St
Locomotive M Co., Arizona.	21. 5c. Sept 1, Oct 5, Oct 24.	A H Fish.	309 Montgomery St
Mono M Co., California.	31. 25c. Sept 17, Oct 27, Nov 30.	H D Walker.	309 Montgomery St
Monte Christo M Co., Nevada.	5. 25c. Aug 17, Sept 23, Oct 14.	L Leavitt.	534 Kearny St
New El Dorado M Co., California.	3. 5c. Oct 2, Nov 6, Nov 27.	J W Pew.	310 Pine St
North Belle Isle M Co., Nevada.	18. 25c. Aug 28, Oct 2, Oct 30.	J W Pew.	310 Pine St
North Gould & Curry M Co., Nevada.	12. 10c. Sept 1, Oct 2, Oct 19.	G H Mason.	321 Montgomery St
Ophir M Co., Nevada.	57. 5c. Oct 2, Nov 4, Nov 21.	E B Holmes.	309 Montgomery St
Orman M Co., Nevada.	62. 50c. Sept 26, Oct 30, Nov 20.	E B Edwards.	414 California St
Peerless M Co., Arizona.	17. 10c. Sept 1, Oct 21, Nov 19.	A Waterman.	309 Montgomery St
Siere Nevada M Co., Nevada.	100. 10c. Sept 1, Oct 11, Dec 1.	E Parker.	309 Montgomery St
Silver King M Co., Arizona.	7. 20c. Aug 18, Sept 23, Oct 27.	J W Pew.	310 Pine St
Union Cons M Co., Nevada.	44. 25c. Aug 31, Oct 5, Oct 26.	A W Barrows.	303 California St
Weldon M Co., Arizona.	4. 5c. Aug 25, Oct 1, Oct 22.	A Waterman.	309 Montgomery St
Yellow Jacket M Co., Nevada.	49. 50c. Aug 31. Oct 2, Nov 7.	W H Blauvelt.	Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Burlington M Co.	A Chemin.	38 Montgomery St.	Annual.	Oct 20
Eureka Cons M Co.	H P Bush.	101 Sansome St.	Annual.	Oct 19
Golden Fleets M Co.	Wm J Gleason.	Phelan Building.	Annual.	Oct 14
Happ Valley Hydraulic M Co., Cal.	D M Kent.	330 Pine St.	Annual.	Oct 24
Mayflower Gravel M Co., California.	D M Kent.	330 Pine St.	Annual.	Oct 19
Neva in Queen M Co., Nevada.	J J Seville.	320 Sansome St.	Annual.	Oct 21
Seal of Nevada M Co., Nevada.	A Chemin.	429 Montgomery St.	Annual.	Oct 16
Washington Blue Gravel M Co., Cal.	H Steingger.	Cor Com'l & Liedesdorf.	Annual.	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M Co.	T Wetzel.	320 Sansome St.	10.	Aug 15
Copa Cal & Virginia M Co., Nevada.	A W Havens.	309 Montgomery St.	50.	Aug 17
Copie M Co.	A H Mason.	314 Montgomery St.	30.	Sept 10
Great Western Quicksilver M Co.	A Halsey.	328 Montgomery St.	23.	Oct 1
Idaho M Co., Grass Valley.		Grass Valley.	3.00.	Aug 4
Mayflower Gravel M Co., California.	D M Kent.	330 Pine St.	50.	Aug 20
North Boulder Cons M Co., California.	T Mitchell.	Grass Valley.	50.	Aug 20
North Commonwealth M Co., Nevada.	J W Pew.	310 Pine St.	100.	June 17
North Star M Co., California.	A H Jennings.	401 California St.	50.	Apr 8
Pacific Coast Borax Co., California.	A H Clough.	230 Montgomery St.	1.00.	Oct 10
Standard Cons M Co., California.	J W Pew.	310 Pine St.	10.	Oct 26

Table of Lowest and Highest Sales in Sales at San Francisco Stock Exchange.

S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 17.	WEEK ENDING Sept. 24.	WEEK ENDING Oct. 1.	WEEK ENDING Oct. 8.
Alpha.	.65	.85	.69	.75
Alta.	.45	.80	.65	.65
Andes.	1.30	1.01	1.25	1.15
Belcher.	1.85	1.85	1.55	1.63
Belle Isle.	.50	.65	.50	.45
Best & Belcher.	3.41	3.93	3.00	3.10
Bullion.	2.00	2.25	2.10	2.20
Challenge.	.50	.60	.60	.45
Bulwer.	.20	.20	.25	.25
Commonwealth.	.60	.75	.57	.65
Con. Va. & Oal.	6.50	7.75	5.37	5.50
Chollar.	1.80	1.95	1.60	1.70
Confidence.	3.90	4.00	4.00	4.00
Con. Imperial.	.10	.10	.10	.10
Crown Point.	1.65	1.95	1.50	1.60
Crocker.	.05	.05	.05	.05
Del Monte.	.20	.20	.20	.15
Eureka Con.	2.60	.65	.55	.70
Grand Prize.	.65	.55	.70	.60
Gould & Curry.	1.85	2.15	1.75	1.90
Hale & Norcross.	1.30	2.00	1.50	1.65
Idaho.	.10	.70	.15	.30
Imperial.	.30	.25	.30	.25
Kentuck.	.30	.25	.30	.25
Lady Wash.	.15	.25	.20	.15
Mono.	.40	.30	.35	.20
Mexican.	2.40	3.15	2.45	2.80
Nevada.	.40	.15	.20	.30
North Belle Isle.	.20	.25	.15	.30
Nev. Queen.	.20	.10	.20	.10
Occidental.	.85	.60	.60	.75
Ophir.	3.20	5.12	3.60	4.30
Overman.	1.25	1.50	1.30	1.40
Potosi.	2.95	3.35	2.60	3.80
Peerless.	.10	.10	.10	.05
Sage.	3.05	3.25	3.10	3.00
S. B. & M.	.75	.75	.60	.65
Sierra Nevada.	3.15	3.60	2.70	2.95
Silver Hill.	.20	.15	.20	.15
Scorpion.	2.35	2.70	2.15	2.30
Union Con.	2.35	2.75	2.15	2.30
Utah.	.70	.65	.75	.65
Yellow Jacket.	1.30	1.50	1.15	1.25

San Francisco Metal and Coal Market.

THURSDAY, October 8, 1891.

Per lb.	ANTIMONY.	STEEL.
Refined, in car lots.	@ 8	6 1/2 Diam tool 9 @ 9
Powdered, do.	@ 8	8 Pick & Hammer. 8 @ 10
Concentrated, do.	@ 7 1/2	7 1/2 Machinist. 4 @ 5
All grades jobbing at advance.		Toe Calk. 4 @ 1
Per ton.	COPPER.	TINPLATE.
Boit.	@ 22	B. V. steel grade.
Sheathing.	@ 22	20 spot. \$ 75 @ —
Ingot, jobbing.	@ 15	Charcoal. 14 1/2 6 50 @ —
Do, wholesale.	@ 14 1/2	Do roofing. 14 1/2 6 50 @ —
Pure Box Sheets.	@ 24	Do, do, 20 1/2. 13 00 @ —
Per base.	IRON.	COAL.
Norway, base.	@ 42	Spot. Load from yard—PER TON.
Pig Iron.	@ 28	Wellington. \$ 30 00
Exhinton @ ton.	@ 28	Glenbrook. 27 00
Am. Soft, No. 1.	@ 28	30 00
Am. Soft, No. 2.	@ 28	30 00
Oregon Pig.	@ 25	30 00
Puget Sound.	@ 27	30 00
Olay Lane White.	@ 24	30 00
Ghotta, No. 1.	@ 27	30 00
Langdon.	@ 25	30 00
Thorncliffe.	@ 26	30 00
Gartsherr.	@ 26	30 00
Barrow.	@ 26	30 00
Cargrove.	@ 26	30 00
Per ton.	CHROME IRON ORE.	LEAD.
Per ton.	@ 10 00	—
Pig.	@ 10 00	—
Sheet.	@ 10 00	—
Pipe.	@ 10 00	—
(Discount 10% on 500 bags.)		—
Drop, @ bag.	@ 1 00	—
Buck, @ bag.	@ 2 10	—
Chilled, @ bag.	@ 3 00	—
By the bush.	QUICKSILVER.	
Flasks, old.	@ 40	50
Do, spot, in bulk.	@ 40	50

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Assessment Notices.

CALIFORNIA AND ARIZONA MINING COMPANY.

Location of principal place of business, 330 Pine Street, San Francisco, California. Location of works, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Directors held on the 29th day of September, 1891, an assessment (No. 4) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, 330 Pine Street, San Francisco, California.

Any stock on which this assessment shall remain unpaid on the 9th day of November, 1891, will be delinquent and will be advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
T. E. JEWELL, Secretary.
Office, 330 Pine Street, San Francisco, California.

NEW EL DORADO GOLD MINING COMPANY.

Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of October, 1891, an assessment (No. 5) of Five Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of November, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 27th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice: There are delinquent upon the following described stock, on account of Assessment (No. 25) levied on the 12th day of August, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amount.
A W Barrows, Trustee.	559	1,000	\$50 00
A W Barrows, Trustee.	562	500	25 00
A W Barrows, Trustee.	568	1,000	50 00
A W Barrows, Trustee.	569	1,000	50 00
A W Barrows, Trustee.	570	500	25 00
A W Barrows, Trustee.	571	1,000	50 00
A W Barrows, Trustee.	572	500	25 00
A W Barrows, Trustee.	573	500	25 00
A W Barrows, Trustee.	574	500	25 00
A W Barrows, Trustee.	575	500	25 00
A W Barrows, Trustee.	576	500	25 00
A W Barrows, Trustee.	577	500	25 00
A W Barrows, Trustee.	578	500	25 00
A W Barrows, Trustee.	579	500	25 00
A W Barrows, Trustee.	580	500	25 00
A W Barrows, Trustee.	581	500	25 00
A W Barrows, Trustee.	582	500	25 00
A W Barrows, Trustee.	583	500	25 00
A W Barrows, Trustee.	584	500	25 00
A W Barrows, Trustee.	585	500	25 00
A W Barrows, Trustee.	586	500	25 00
A W Barrows, Trustee.	587	500	25 00
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PARKE & LACY COMPANY,

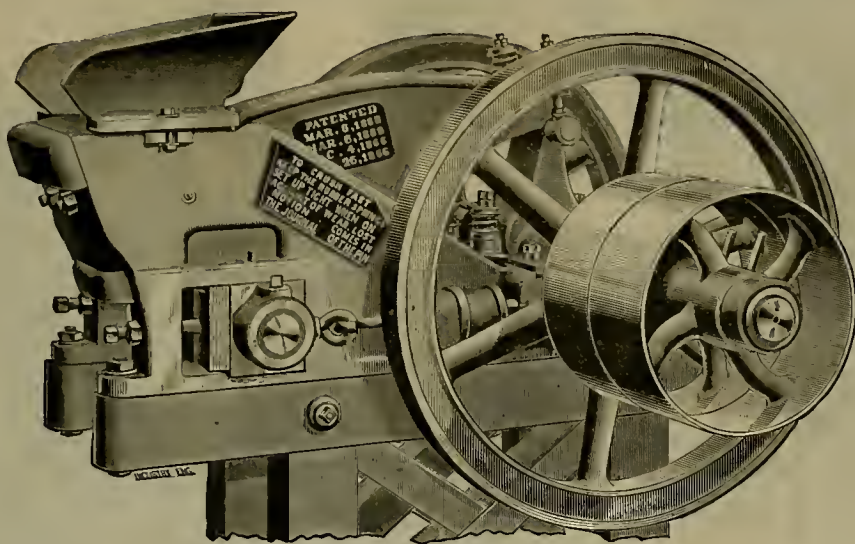
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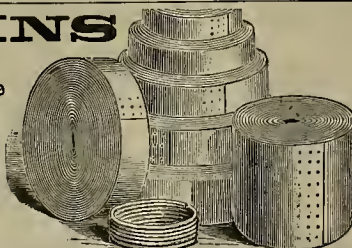
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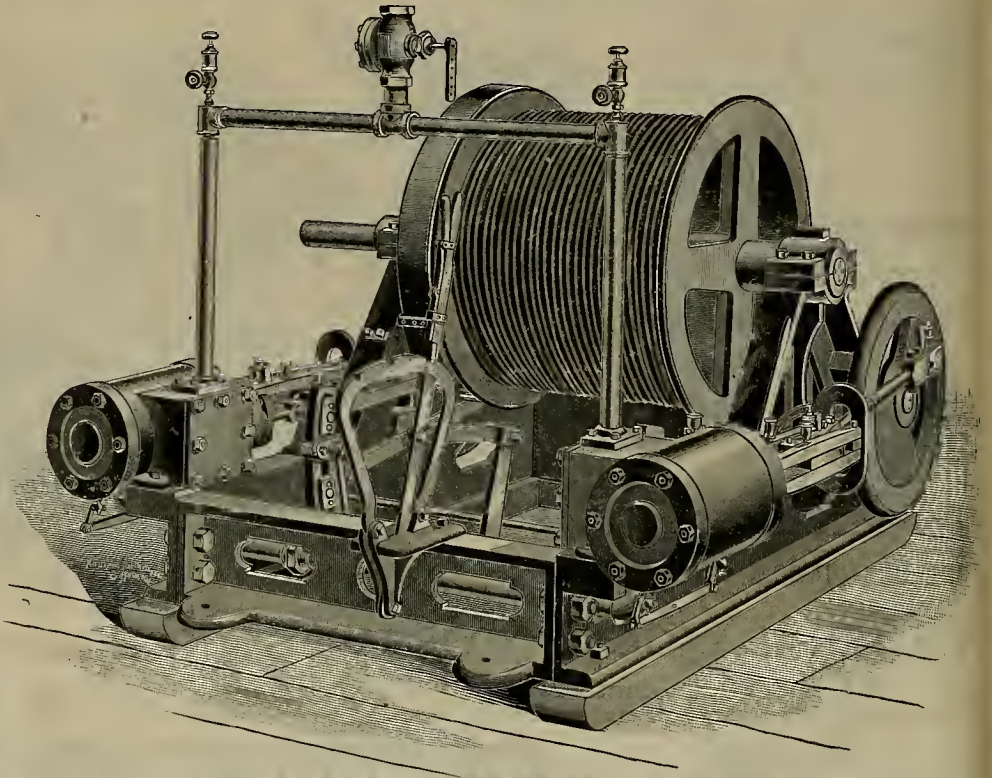
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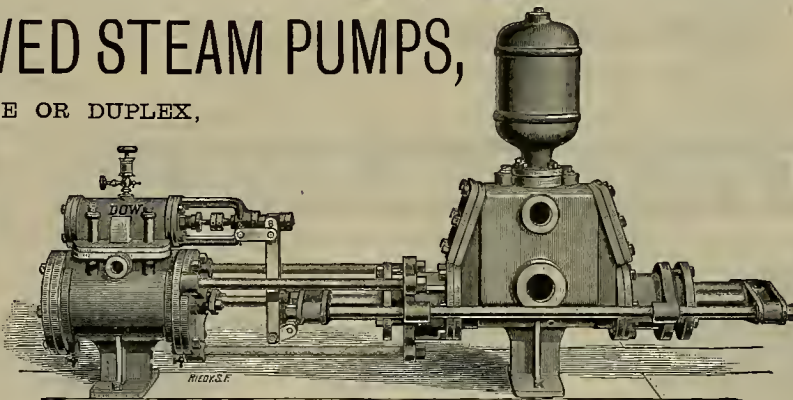
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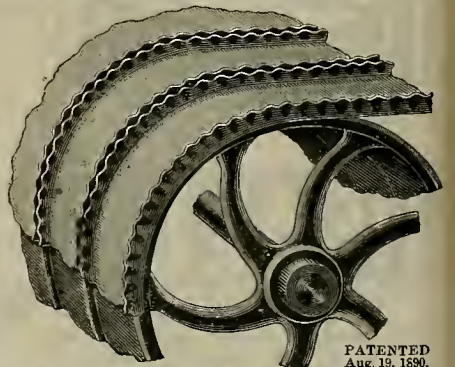
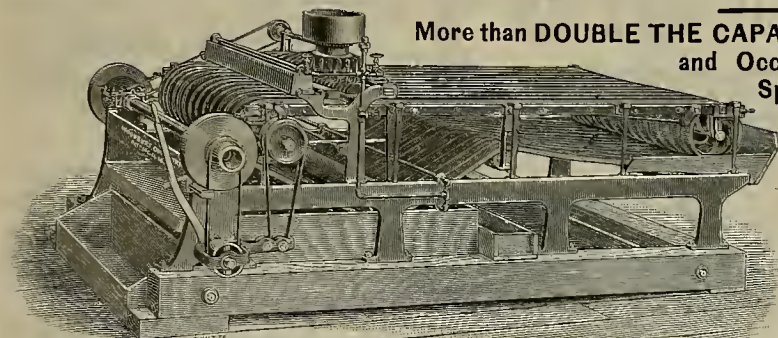
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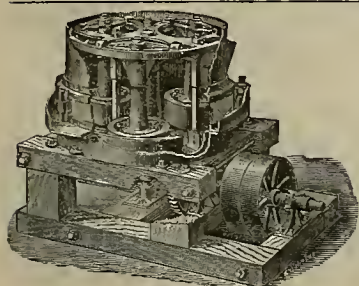
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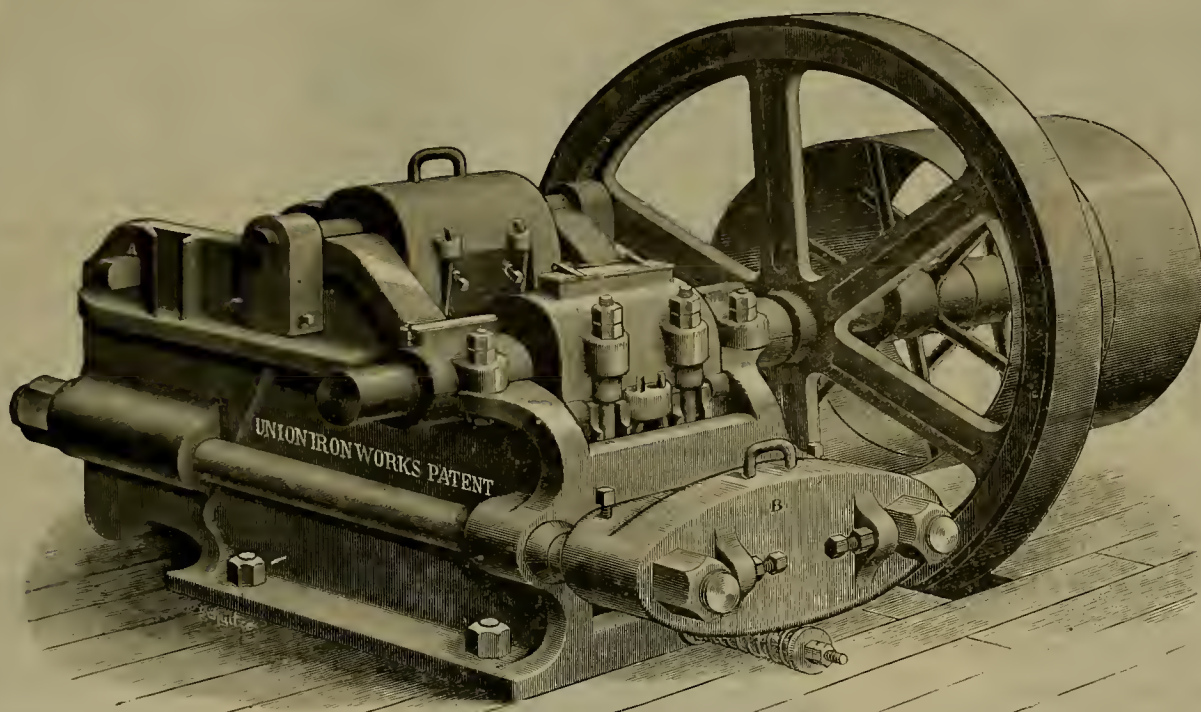
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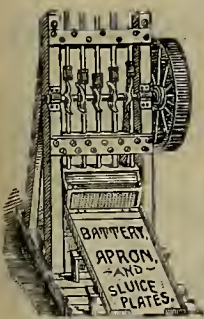
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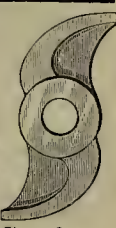
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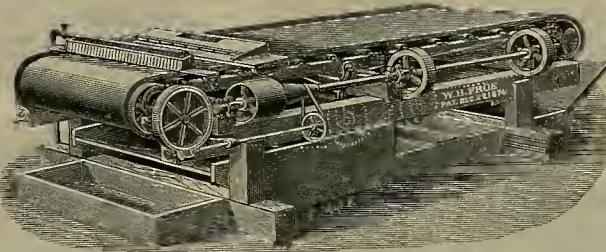
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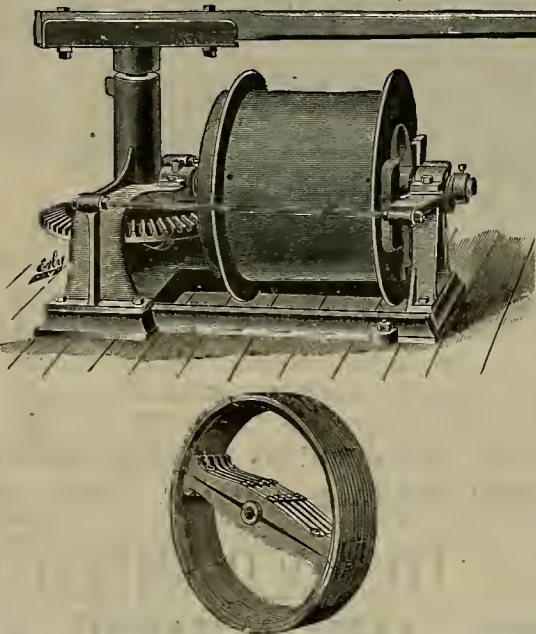
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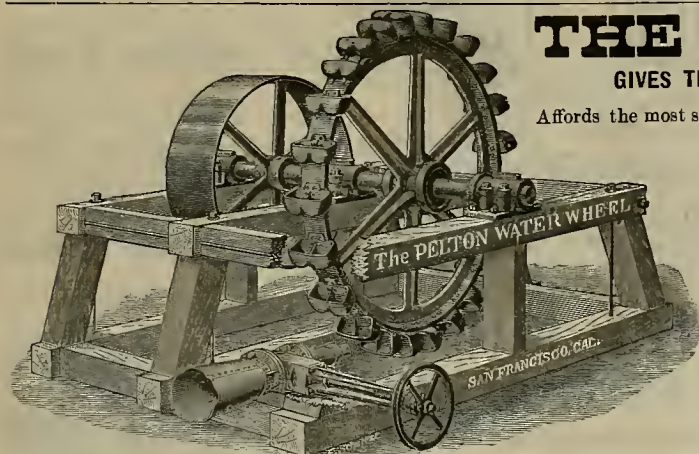


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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 16.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 17, 1891.

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A Centrifugal Gold Extracting Process.

A plant designed for dealing with gold ores has been devised by Rowland Jordan, and made by T. B. Jordan & Son, 15 George St., Mansion House, London. As described in "Lock's Ore Dressing Machinery" it consists of two portions—the reducer and amalgamator. The reducer is shown in Fig. 1 of the accompanying cuts, and the amalgamator in Figs. 2 and 3. The author's report says:

The plant employed is remarkable for its simplicity, and but little description is necessary. The menal stone-breaker begins the process. This is followed by a revolving pan, set at an angle, and carrying three massive balls of white iron, which work in a suitably shaped bed, also of white iron, round the greatest circumference of the pan. The ore and water are fed automatically into the bed of the pan, and by the rotary motion of the latter, are conveyed under the rapidly revolving balls, whereby the comminution of the ore is effected. The inner half of the floor of the pan rises as a shallow dome surrounding the central shafts, and is fitted with movable frames carrying wire screens of any required mesh. The feeds of ore and water and the inclination of the screens are so adjusted that, as the ore is reduced to a sufficient degree of fineness, it is washed over the screens and passed away into a launder for conveyance to the amalgamator.

The inventor says that generally it may be stated that the total cost of the patent plant erected at the mines will not exceed one-half that of a stamp battery.

The patent pan has a continuous action on an evenly distributed and constantly changing layer of ore, and thus accomplishes a great amount of work.

Trials with various ores showed a power of reducing 20 to 25 tons per 24 hours to a size that would pass an 80-mesh screen, which is faster than battery work, where the outlet for the pulp is limited. With a patent pan this

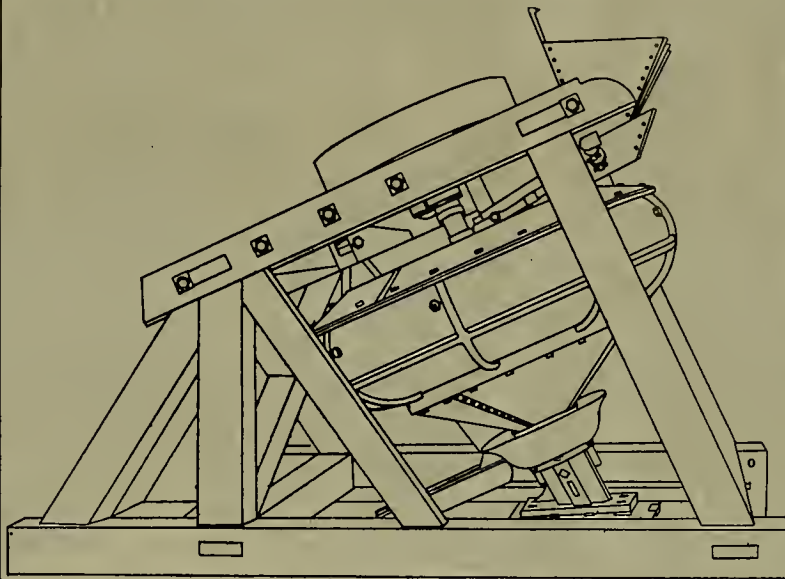


FIG. 1.—JORDAN'S REDUCER.

drawback is obviated. The screen area is much greater in proportion, and the screens set at a very low angle (almost horizontal). These features, combined with the wash produced by the rotation of the mill and inclination of the jet of feed water, increase the facilities of outlet in a most remarkable degree.

Another advantage which, in most cases, would be of primary importance is that the consumption of water is only about half the amount required by a battery. In a crushing of "Edwin Bray" ore, the water feed was only a 1-inch pipe, and the ore, fed from a stone-breaker, was passed through an 80-mesh screen at surprising rate, not less than 20 tons per 24 hours. Such a result speaks for itself. Moreover the power used to effect this is about half

that needed with stamps, while the labor is virtually nil. With automatic feeds one man could watch a dozen pans, and the prodigal use of mercury, so common with stamp batteries, is dispensed with.

In wear and repairs the patent pan has advantages over the battery. There are only two wearing parts in the pan, i. e., the balls and their bed. An examination of the latter, after six months' intermittent use shows that the two surfaces wear in such a way as to maintain their proper relation to each other. When worn too thin, the bed can be removed and replaced by a new one with very little trouble. The screens are much less exposed to injury and wear, and are readily detached and renewed, any desired mesh being adopted.

The only other apparatus employed in the process is a novel form of amalgamator. The stream of pulp, without any addition of water, flows into the hopper of this amalgamator.

This machine consists of a series of shallow dishes, attached one below another to a central revolving shaft, and inclosed in a fixed circular casing, which is kept under lock and key. Secured to the inner side of the casing, and alternating with the dishes, are slightly inclined shelves, also amalgamated. The pulp fed into the amalgamator enters the first dish, in which it is revolved until impelled by the centrifugal motion over the edge of a dish. It then falls on one of the shelves and is thus conveyed to the center of the second dish, there to undergo similar treatment. This is repeated to the end of the series, where the tailings escape. The free gold and silver contained in the pulp are completely arrested by the amalgamated dishes and shelves.

The very high efficacy of this patent amalgamator is apparently due to several causes. In the first place, the ore is reduced in the pan to such a degree of fineness that all precious metals not actually in chemical combination are set free. Then the shape of the dishes and the manner and speed of rotation all tend to insure intimate contact between the atoms of precious metal and amalgamated plates, so that the finest particles of float gold are retained, and the gentle attrition of this flowing pulp maintains the amalgamated surfaces in a constantly bright and favorable condition. Any amalgam which may have become detached is caught in a wall at the bottom of the machine.

An average of a number of samples of ore, refractory in its character, showed a result of 91 per cent extracted, and with free gold only the percentage was much higher. The inventor claims to be able to extract nearly all the gold even from pyritic ores, without calcination; and claims also, that in some instances it will be found more advantageous than chlorination.

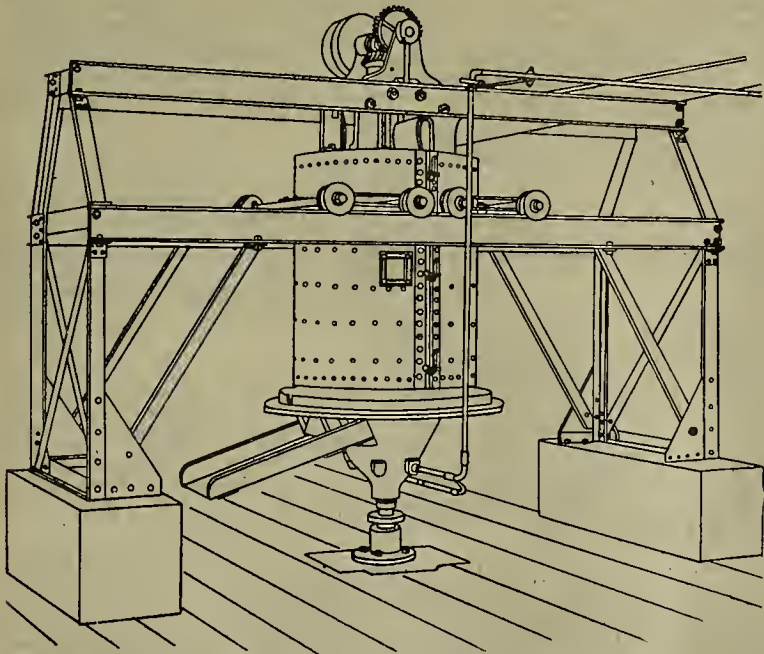


FIG. 2.—JORDAN'S CENTRIFUGAL AMALGAMATOR.

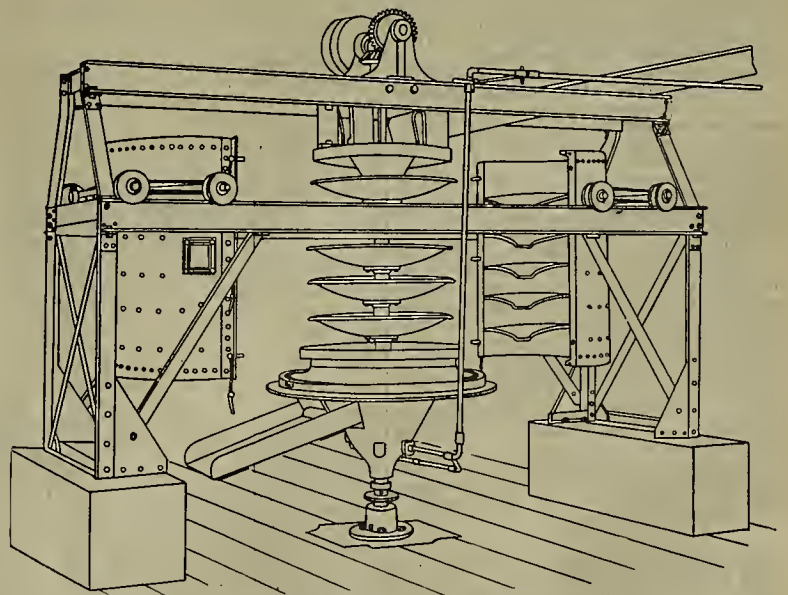


FIG. 3.—INTERIOR VIEW OF JORDAN'S AMALGAMATOR.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

La-sen County Mining Interests.

[By Our Traveling Correspondent.]

About 12 miles west of Susanville there is a mineralized belt that carries a fair per cent of copper, and in consequence the place is called Copper Vale.

Here, years ago, a copper company took hold of the copper deposits, but had not got fairly under way when the bottom dropped out of copper and the business was abandoned. The copper is said to carry a sufficient percentage of gold to cover all expenses; if so, with the new system of electric separation, this ore could be worked to a big profit as a smelting proposition.

The Spanish Copper Ledge.

Barrett & Lathrop are proprietors of this property. It is situated about two miles southwest of Copper Vale, and owes its name to the fact that it was first discovered and prospected by Spaniards in search of gold. The vein runs from 15 inches to 2 feet, and crops for 300 feet on the ledge. The only development consists of an eight-foot shaft, but the mine is not a copper nor a gold proposition. While the vein matter carries a small percentage of copper, it carries a large amount of antimony and is a vein of antimony ore, with a small percentage of silver and copper.

South of Clear creek a mountain breaks through the lava that carries a belt of porphyritic slate, 300 feet in width throughout the entire length of the mountain. At the junction of this porphyry with the slate, a crop of iron crops and follows the course of the junction. The decomposed porphyry prospects in visible free gold. It is a question whether this gold comes from this porphyry belt, as in the mines at the Strawberry district, Dakota, where the whole mountain of porphyry is gold bearing, or from the contact vein which undoubtedly underlies the "iron belt." There are no miners in this section, and in consequence, very little if any prospecting done. There are the usual mining fables of the "White Mole Diggings," rich float, etc., but nothing has ever been done, nor is likely ever to be done in the way of developing the mineral resources of this section by the people in it.

La-sen is a county that has some fine little valleys, but the greater portion of the county is a rocky waste, almost the entire surface of the county is covered with lava, and even the hills are composed of the lava. It is a rare thing for ore of the original hills to break through this lava flow and in consequence there is very little mining ground.

E. H. SCHAEFFLE.

Native Alloy of Nickel and Iron.

EDITORS PRESS:—In your issue of Sept. 26th, I notice an article on a native alloy of nickel and iron found in New Zealand, and supposed to be a new discovery, to which mineral the name "Awaruite" has been given.

The same mineral was found by the writer during the summer of 1859, on Trinity Bar or Fraser river, about five miles below Fort Yale, in the sands of the bar, and associated with gold, platinum, magnetic iron, titaniferous iron and an abundance of garnets. The grains were small and flat, seldom over one-sixteenth in extreme length, of a steel-gray color with a faint bronze tinge, malleable and strongly attracted by the magnet. An analysis by the writer gave nearly identical results with those quoted: Nickel, 70 per cent; iron, 30 per cent, and a trace of copper.

Some years afterward, samples of this mineral were sent to some of the savants of San Francisco for examination, and I believe a paper on the subject was read before the Academy of Sciences, and the mineral was dubbed *Fraserite*. Subsequently (during 1873) I gave to Prof. Whitney, then in charge of the Geological Survey of this State, samples of the nickel-iron, with other minerals accompanying it, who sent it East to Prof. Gibbs for analysis, but while the general composition as above mentioned was confirmed by him, no full report was ever rendered to the donor, who still claims the honor of the discovery. It is doubtful if it was a new mineral, as Prof. Bishop, in his "Geognoside," mentions the occurrence of a similar alloy in Brazil and also in the Ural mountains.

On Fraser river it was found on all the bars between Fort Yale and Fort Hope, but never *in situ*, but is not easily noticed, being mingled with sands similar in color and specific gravity. Platinum in fine grains and scales, although by no means rare in the same region, has seldom been noticed by men of science.

There is strong probability that the nickel-iron will be found in Trinity river or in the bench and beach deposits near its mouth; but it is not likely ever to become of any practical importance.

A small amount of the mineral is yet in the possession of the writer, from whom small samples may be obtained.

J. A. EDMAN.

Meadow Valley, Plumas Co., Oct. 1, 1891.

THE natural gas well at Sacramento was sunk 920 feet, when the contractors quit because the piping became edged. There is a fine flow of water and about 2000 feet of gas a day. Money is lacking to complete the work,

Birds for California.

F. Reiser, of Santa Cruz, writes to the *Scientist* in this interesting manner: The other day I read an article in your paper copied from the *Bulletin* about the importation of song birds from Germany. I am very glad that the advance guard of these birds will soon be here, and the beautiful gardens and hills of lovely Santa Cruz will soon be filled with the songs of these birds. From the beginning I have been deeply interested in this "novel enterprise," and have done as much as I could to further the same. I have had several conversations with Mr. Robison (not Robinson), the San Francisco bird dealer, and at his request mentioned to him the kinds of birds best suited for importation. Last January I also published an article in the *Bulletin* and the *Call* describing these kinds of birds (of which I have been an enthusiastic student since the days of my infancy), and also showing the advantages which they may bring to our orchards, vineyards and farms. And imagine the pleasure every lover of nature would experience in hearing from the brush, the hedges and gardens the song of the nightingale, the black cap, the robin red-breast and other sweet songsters, while from the distant woods would come the answering notes of the thrush, the sweet mavis of the poets!

Among the insectivorous or soft-billed birds, as very useful and suitable for importation, may be mentioned the following kinds: The so-called grasshopper warblers (*Sylviidae*), the gnat catchers (*Muscicapidae*), the titmouses (*Paridae*), and the thrushes (*Turdinae*). The *Sylviidae* are a large family of most beautiful singers, similar to our wood warblers (*Holotilidae*), although superior in song; but not only are they good songsters, but also very useful birds, living only on insects and their larvae and small worms. As belonging to this family may only be mentioned the nightingale, robin red breast, the black-cap, the white-throat and habbling warblers and many others. The *Paridae* are beautiful birds, though not very prominent in song. They travel in swarms from garden to garden, picking diligently the insects and their eggs from the trees and from under their leaves. About seven or eight species belong to this family, and they are all considered to be most useful, especially for the destroying of the insect pests of the orchards. I was therefore greatly surprised to read in that article of the *Southern California Horticulturist*, who set loose several (?) titmouses in his orchard and calculates that they ate or destroyed fully ten per cent of his fruit crop. I have never heard of such a thing before nor seen any titmouse eat any fruit. Only in winter, when insects are scarce, they allow themselves to eat besides insect eggs some kinds of seeds, as hemp, sunflower seeds, etc. As for the *Turdinae* (thrushes), they live not upon insects that infect the trees, but satisfy their appetite from larger insects and worms living on the ground. Although very good singers, they may do some damage to the different kinds of berries.

Among the granivorous birds may be mentioned the finches (*Fringillinae*) and larks (*Alaudidae*). They live upon seeds and grain, using insects only for feeding up their young. The fame of the sky-lark is world wide. Among the finches the best known are the goldfinch, oatfinch, bullfinch, siskin and linnet. They are bright in plumage, and all more or less good singers, except the bullfinch, which has, though, a wonderful faculty to learn to whistle songs. I noticed that in the article of the *Bulletin* the goldfinch, bullfinch and sky-lark are counted to the "soft-billed birds." This is a mistake, as they belong to the granivorous class.

According to my judgment all these birds would thrive very well in this State, and especially around Santa Cruz. I have kept thrushes, goldfinches, linnets, siskins and larks in San Francisco in cages for years, and they did very well, singing like in the gardens and beautiful woods of distant Germany.

But in looking for help and enjoyment to these foreign birds, let us not forget to do homage to our own. We also have warblers and finches in great numbers. I have made careful observations and found the avian fauna, especially of Santa Cruz, to be very rich. Blue birds, brown thrushes, gnat-catchers, warblers, horned larks, vireos, cross-bills, linnets, wild canaries (siskins), song sparrows, black-crested flycatchers, orioles, blackbirds and many others are here in great numbers, as also swarms of titmouses, which I have watched flying from tree to tree, doing their good work. Most of our California birds are beautiful in plumage and are good singers, but for us, it is to protect them and give them shelter for bringing up their young. There are especially two enemies, which bring destruction to our sweet singers, i. e., the cat and the heartless boy with the slingshot. The cat is the deadliest enemy of the birds, and wherever there is a cat in a garden it is next to impossible for the birds to raise their young. The cat kills everything being of bird, young and old and living, and some cats kill more young birds in a year (roaming through the gardens and fields) than mice in their whole life. Therefore, every lover of birds must keep his garden clear from the cat and the boy with the slingshot. Wooden boxes, about a foot square, and with a hole just large enough for the bird to slip in, should be hung high up in the trees, in which the birds could build their nests.

Mail Delivery in Rural Districts.

Almost from the beginning of his term as Postmaster-General, Mr. Wanamaker has felt that with the liberal additions to the postal facilities to cities, the extension of the service into the country was perhaps being neglected. He early conceived the idea, therefore, of furnishing the free delivery service to villages and farming districts, in a way not only to supply the inhabitants of these communities with the best postal service, but to cause little or no expense to the Department in the end. He secured from the last Congress an appropriation of \$10,000 with which to try this free delivery experiment. This money was to be spent as in the case of the money appropriated for the regular carrier service of cities and towns; but the Postmaster-General was allowed great freedom in the selection of the communities to be served and in the methods to be pursued.

He promptly began the selection of villages and farming districts upon the application of the inhabitants of these communities. The nature of the service was not generally known, and it was not until after members of Congress had been requested to name certain communities which they desired to receive the benefits of the experiment that the total of \$10,000 was finally disbursed. The sum used in each community was something over \$200. It is now seen that the experiment might have been applied to a larger range of communities and might in general, therefore, have been made more nearly a complete success, if it had been possible to regulate the sums expended according to the different sizes of the communities.

But with the means at his command, and with the prescribed methods set down, the Postmaster-General went to work to put the experiment into effect. The postmasters at the different places where carriers have been put on have watched the operations of the experiment closely, and have from time to time reported their successes to the Postoffice Department. In the 40 or more towns where the experiment has been in operation, it is found that the revenues of the offices have been greatly increased, and that while in some cases they have not entirely met the expenditure, yet in every case the receipts have been greatly increased, and it is believed that, on the whole, the total of extra income from the whole number of towns will almost, if not quite, equal the total expenditure of \$10,000. In many of the places the experiment has only been on trial for a few months, and consequently its full benefits to the people served, and hence its full revenue-producing power, cannot be fully calculated.

The Postmaster-General is now about to examine the reports from all the communities for the purpose of digesting them and of making his recommendation to Congress. He has steadily believed all along that a principle would be discovered in these experiments by which, when a certain area and a certain population to be served are taken into account, a certain increase to the postal revenue in that community may be counted upon with almost mathematical certainty. The principle, if it can be discovered and set forth clearly, can easily be seen to be susceptible of forming the basis of a regular mathematical scheme, by which, when it is known what certain areas and populations are, Congress may confidently appropriate money to be expended in the right proportion, on the reasonable certainty that the increases in revenue will almost if not quite make up for it.

THE WHEELER CONDENSER & ENGINEERING COMPANY has recently filed articles of incorporation with the Secretary of State, at Trenton, N. J. The company has bought out the entire plant and business of the Colwell Iron Works at Carteret, N. J., which is one of the largest concerns in this country manufacturing vacuum pans and special machinery for sugar refineries, salt works, condensed milk factories, etc. The Wheeler Company will continue to manufacture Wheeler's patent surface condensers and other of his specialties. The capital stock of the company is \$300,000, and the incorporators are as follows: Fredk. Merlam, Wheeler of Montclair, N. J.; Aaron Vanderbilt of New York City; Clifton H. Wheeler of Brooklyn, N. Y.; Wm. H. Hampton of New York City, and Charles W. Wheeler of Brooklyn, N. Y. The headquarters of the company will be at 92 and 94 Liberty street, New York City.

ARIZONA MINERAL WEALTH.—Hon. N. O. Murphy, Acting Governor of Arizona, in his annual report to the Secretary of the Interior says that mining has always been the foremost wealth producing industry of Arizona, and the report says that during the last year it has been very active. The mineral output of 1891, it is thought, will exceed that of any previous year. The Acting Governor estimates the copper output at 30,000,000 pounds, the gold output at \$1,132,955, silver, \$1,683,585. During the year very valuable deposits of superior onyx have been discovered, and the quality is said to be first class.

ACADEMY OF SCIENCES.—The California Academy of Sciences met Monday evening, with Dr. Harkness presiding. The following were elected members: President, David S. Jordan of Stanford University; Joseph Swain, professor of astronomy; Charles H. Gilbert, professor of zoology, and D. H. Campbell, professor of botany, all of the same institution,

Very Low-Grade Ore.

A mine to be a good "company mine" should be a large one and worked on a large scale, writes Albert Williams in the *Engineering Magazine*. In order to pay dividends on shares numbering from 100,000 to 1,000,000, the profits have to be considerable or the dividend per share becomes insignificant and disappointing. It is seldom, for instance, that the California corporations, operating mines mainly in Nevada, offer their shareholder less than 25 cent dividends, which on the usual capitalization of \$10,000,000 in 100,000 shares would mean the very respectable sum of \$25,000. One such dividend a year would be a creditable exhibit for a mine owned by one or two persons. Thus, to be a promising purchase for a proposed corporation, a mine ought to be one which can be worked by a considerable force to insure steadiness of output. A rich but narrow vein where only a limited number of men have room for stopping may be the best for individual ownership, since running expenses are low, and it is not so good for a company as a large deposit of lower grade, capable of being extensively opened and presenting large breasts in the stopes, with a more regular output. The most reliable gold mines have been of very low grade, but with large and regular deposits. In California \$15 a ton is considered a very fair basis for a company mine if the ore is in quantity; but a very much lower tenor has been worked with great profit in the exceptionally large deposits of the Black Hills and Alaska, where \$5 a ton would leave a liberal margin for dividends. In fact, most of the famous mines have not been of high grade, the gold ore rarely showing any metal to the eye, so that most miners have a prejudice against what are called "specimen mines." The same holds to a less extent with the silver and ore mines. On the Comstock, the heart of "the big bonanza," the greatest ore body ever known, averaged only \$89 per ton, including the rich streaks, and that was thought to be very high. The great silver mines of Montana have not averaged anything like as much. There have been exceptions, notably in Arizona, Colorado and Utah, where high-grade ores in comparatively small amounts have produced largely; but, speaking generally, the celebrated mines have not been of that class.

Utilizing Waste Steam.

Mr. S. L. Coburn, of Battle Mountain, Nevada, has patented a device whereby waste steam can be utilized from a locomotive when stopping at a way station for the purpose of taking in wood, water, or other purposes, the steam saved being used to pump water for the tanks or reservoirs about the station. Customarily each large station has to be supplied with an engine and steam pump, and then use fuel for making steam. In this case Mr. Coburn claims that the first cost of improvement will be less than that for the ordinary steam-pumping arrangements now in use (which latter requires an attendant more or less of the time) so that more than the entire cost of steam will be gained in applying his apparatus. It has been tested and the inventor is satisfied of its practicability.

THE AUTOMATIC REGISTRATION OF RIVER PROFILES.—An ingenious instrument, by means of which the profile of a river bed can be taken automatically from a boat at the rate of 3½ to 6½ miles per hour, has been invented by a German engineer, Herr Steichner. The apparatus consists of a curved arm, which is hinged at its upper extremity, and is so long that the lower curved portion trails on the bed of the stream. As a matter of course, the deeper the stream the greater will be the inclination of the arm, and hence, by suitable recording mechanism, the depth can be automatically registered on a revolving drum as the boat proceeds on its course. The instrument has recently been practically tested on the Elbe, when soundings were taken over a distance of 297 miles in ten days.

GEOLOGY IN WASHINGTON.—A dispatch from Tacoma, Wash., says State Geologist Bethune has decided to immediately close the office of the State Geologist, as there is no money available for continuing it. Bethune says he will resign his office as soon as he has completed his annual report. He is thoroughly disgusted with the failure of the State to provide funds for a geological survey, and as his salary is only \$100 per month, he will retire to private life.

MECHANIC'S FAIR.—At a meeting of the Mechanic's Institute Trustees last week, a statement from the Treasurer showed that the total receipts of the fair amounted to \$47,946.58, derived from the following sources: Sale of tickets, \$41,172.68; privileges, \$5838.50; gas and labor, \$323.10; catalogues, \$12.30; donations, \$600. The expenses are estimated at \$29,000, leaving a net gain of \$18,946.58.

PRESIDENT THURSTON, of the Jersey City and Bergen Railroad Company, is authority for the statement that his company and the Rapid Transit Company, of Newark, N. J., have been in conference with a view to establish an electric road between Jersey City and Newark. If it is built, the road will be one of the longest electric lines in the country, with the enormous capital of \$25,000,000.



MARIN COUNTY COURT HOUSE, SAN RAFAEL.

Marin County.

We give herewith a handsome picture of the Marin county courthouse situated at the county seat San Rafael, one of the most picturesque and popular towns in the bay region of California. The *Illustrated Pacific States* in its September issue pays much attention to the interests of Marin county, its towns and beautiful suburban residences and resorts, and we take therefore this view of the county's temple of justice and some general notes on the county.

The fame of health-restoring, pleasure-giving San Rafael and picturesque Sausalito leads many short-sighted persons to the conclusion that Marin county exists simply as a sort of geographical casket to contain these beautiful gems. Nothing could be more unfair to this garden spot of California, for such Marin county surely is.

That, despite the countless columns of descriptive matter, which have been printed regarding Marin, thousands upon thousands of acres of the finest dairy or grazing land in the State is for sale at almost a nominal price, within 37 miles of San Francisco, certainly proves that a vast number of people are still ignorant of Marin county's resources.

Here is a county containing 350,000 acres, or nearly 600 square miles, with a soil which, it is now known, is capable of producing not only potatoes, grass and grain, but also nearly all the smaller fruits to perfection, and yet, which, up to within a very few years, has been devoted exclusively to one industry, namely, that of dairying. But though dairy-farming will undoubtedly continue to be the leading industry of the

county, Marin is, nevertheless, awakening to her wonderful possibilities in other directions, and thousands of acres which have heretofore lain idle as prospective grazing land, are now turning their rich soil up before the husbandman's plow, and other thousands of acres of rolling uplands, which have been abandoned to underbrush, are now covered with vineyards as luxuriant as the vine-clad hills of France.

Marin county is a peninsula formed by Sonoma county on the north, by the bays of San Francisco and San Pablo on the east, by the Pacific Ocean on the west, and by the Golden Gate on the south. The extreme southern portion of Marin county is but three miles distant from San Francisco, a proximity which contains a world of significance from a commercial point of view.

COAST FORMATION.

Being peninsular in form to an accentuated degree, Marin county would of necessity possess a generous coast line, but this boundary is rendered far more extensive by the indentations caused by Tomales, Drake's, Limantour, Bolinas and Richardson's bays. All of these bays are navigable for ordinary coast schooners, while Richardson's bay will accommodate vessels of great burden. It will thus be seen that there is no lack of transportation along the entire coast. The most important of the bays above mentioned is Tomales bay, located in the northwestern portion of Marin, 45 miles north of San Francisco. It is a beautiful sheet of water, 18 miles long, with an average width of about a mile and a quarter. It is completely landlocked, extends almost to the middle of the county, and can be entered by ships drawing 20 feet of water. The advent of the North Pacific Coast railroad, which skirts its eastern shore, has deprived Tomales bay of most of its commercial importance, but the extreme beauty of its surroundings, its safety and its freedom from winds will ever render it a favorite resort for

the camper, sportsman and excursionist, TOPOGRAPHY AND CLIMATE.

Level land is at a decided premium in Marin county, all her valleys being extremely narrow. The general formation consists of a succession of rolling hills and uplands. It must not be inferred from this, however, that tillable land is scarce, for the land of these gently undulating hillocks is as fertile and productive as can be found in the State. Along the shores of San Francisco and San Pablo bays are probably 25,000 acres of salt-marsh land, which, until recently, has been regarded as so much waste territory. Its reclamation has, however, been demonstrated, and it is being rapidly converted into excellent meadow soil.

Running the entire length of the county, from the north to the Golden Gate, is the great climate-maker, the Tamalpais ridge, a spur of the Coast Range. This ridge it is, which, forming a natural barrier against the raw winds and fogs of old ocean, gives to the interior of Marin a climate which the "globe trotters" insist is unsurpassed on the shores of the Mediterranean, or in the isles of the sea. Marin boasts no rivers, but irrigation is never required, the annual rainfall, together with the humidity of the atmosphere, resulting from the proximity of ocean and bays, giving all the moisture necessary for agricultural and horticultural purposes.

Lick Observatory.

A Scheme to Arouse Public Interest.

For some time the astronomers in charge of the Lick Observatory have complained that they have been seriously hampered in their work by a shortage of funds.

In speaking of the matter to a *Chronicle* reporter, Prof. E. S. Holden remarked that the interest on the sum left over by the late James Lick in his endowment gift—about \$100,000—does not begin to provide the means to utilize the great instrument on Mt. Hamilton, and, indeed, is scarcely sufficient to do more than

to publish the mere results of the work done. The elaborate plan of securing and reproducing lunar negatives and other enterprises of a like nature are items of expense not met by the funds at the disposal of the Regents.

Prof. Holden called these facts to the attention of Regent Phelps in a letter a few days ago. After giving the subject the serious thought which it demanded, Regent Phelps has outlined a plan which in all probability will be submitted to the Board of Regents at its meeting on Tuesday next. Mr. Phelps described his scheme to a *Chronicle* reporter.

"I have always been disagreeably impressed with the fact," he said, "that thus far the scientific triumphs and marvelous results made by the Lick telescope have occasioned more interest abroad than at home. Why this should be so I do not know. To offset this apathy, Prof. Barnard planned his series of lectures throughout the State to popularize astronomy. Now that the observatory requires more monetary assistance, I propose that those persons who are interested in astronomy shall be brought into direct contact with the observatory by means of an association—a Lick Observatory Association. The society would be composed of contributing members, who, upon the payment of initiation fees and small monthly or quarterly dues, would become entitled to directly share in the splendid privileges now withheld from the general public purely through a lack of funds.

"In such an event the privileges would be many. The members would become entitled to receive the interesting bulletins and valuable reports issued by the astronomers, as well as reproductions of the lunar and other celestial photographs being made. Each member might, upon entering the association, be given a parchment certificate of affiliation. By this method we would soon have a community of students taken from the people at large, and California would receive an intellectual stimulus quite in keeping with the advancement of the State in other lines. I am very much impressed with the entire reasonableness and efficacy of this enterprise."

ONLY California building material is to be used hereafter on the construction of Federal buildings in this State, and a collection of good building stone is being made for the Government.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Oct. 10: Our mines are looking up. At the Wildman they are making preparations for sinking another 100 feet, and expect to begin next week. Superintendent Tregloan and Sidney Higgins, the foreman, feel confident that they can run the mill and sink at the same time, which will enable them to pay the expense of sinking from the product of the mine. The work of raising the rock-crusher and making other improvements about the hoisting works is about finished, and everything is in good shape for the winter. S. D. Valentine has returned from a two-weeks' visit to San Francisco, and reports everything encouraging about the Hector. Surface work is to be continued; the mill will be kept running steadily. The water will be taken out of the shaft and the property explored in the lower levels as soon as they can get at them. Repairing at the Lincoln is completed and the mill is now in good shape for the winter's run. Improvements are still being made at the Belmont, and everything is said to be looking well.

PLYMOUTH CONSOLIDATED.—*Ledger*, Oct. 10: The force of miners at this mine was increased last week by eight. Twenty stamps of the mill are now dropping, with the indications of continuing for some time.

NEW YORK.—Everything is hustling at this claim, three miles southwest of Jackson. The building they are putting up is 80 feet long by 30 feet wide, sufficient for a 20-stamp mill. The building is about ready for roofing. The large six-foot Huntington roller quartz mill will be on the ground as soon as the workmen are ready for it. It is to be supplied with Woodbury concentrators, and run for 30 days on trial, and if the result is satisfactory, another mill of the same kind will be erected. If the test does not come up to expectation, probably ten stamps will be put in, and the roller and stamp mills run side by side, on the same character of ore, which will prove beyond all question which kind of plant is better adapted to treat the ores of that section. W. G. Anderson, the superintendent, says there is abundance of rock to keep a 40-stamp mill going.

ONEIDA.—Robert Robertson, formerly superintendent of this property in its active days, has secured a lease or bond of the mine, and will take charge next Wednesday. We are not in a position to say what this change means. The Oneida naturally assumes greater importance from the fact of the bonanza met with in the Kennedy teedog in that direction, and also the fact that the southern portion of the Oneida—joining the Kennedy—has never been prospected. We look for the reopening of the Old Oneida ere long, and after long years of idleness it may prove, like its neighbor the Kennedy, a rich dividend-payer to the company that undertakes its further exploration.

MISCELLANEOUS.—The Clifton Consolidated has declared its eighth dividend of 10 cents per share, payable on and after Monday, October 5th. Improvements continue to be made at the mine. A heater for the chlorination works went up on Tuesday. Mr. Hazleton, one of the proprietors of the San Francisco *Post* was up a couple of weeks ago on business pertaining to the mine. Geo. Thomas, who has been operating the White claim between Jackson and the Gate under a bond for some months, is having some rock hauled to the mill of the Amador gold mine for a test crushing. The Zelle has added considerably to its force of miners the last few days. Many of the new hands are from Colorado, as the miners do not care to face winter in the mountain camps of that State. The mine is said to be looking well, the ledge at the 1000-foot level showing up in immense strength, and with less waste than in the levels above.

Butte.

PALO ALTO.—Oroville *Register*, Oct. 8: L. H. Ayers came down from the Palo Alto mine last week and went to San Francisco on Friday, but returned on Saturday night. He tells us that 25 men are at present employed in the mill and mine and that the 20 stamps will be in running order in about two weeks. The water to run these stamps is brought in under a pressure of 125 feet, and a hurdy-gurdy wheel with Knight buckets is used. As soon as the new mill is ready to start, a Pelton wheel will be used instead of the present hurdy which has run the ten stamps of the old mill. He says that some 12 men are employed at the American Eagle mine, and that about 20 others are prospecting in the neighborhood. It is reported that very rich rock has been struck in the A. E. mine, and the mill is turning out gold rapidly.

Calaveras.

GOLD.—*Prospect*, Oct. 10: Calaveras takes leading rank among bullion producing counties, and the shipments for the past week have kept Wells, Fargo and Co.'s messengers pretty busy. No one outside of those directly concerned knows the exact amounts, but from Sheep Ranch and Angels have gone during that time over \$50,000. The Enright mine and mill at Railroad are running now on full time, about 20 men being employed with prospect of more. The mine is looking well and Mr. Enright, the owner, seems confident. It is said that Mr. Bennett is getting ready to start up the Lockwood mine at West Point. A new company has taken hold of the Woodhouse mine at West Point and it is reported that two tunnels will soon be run. The Graves mine at West Point is looking well, the last rock taken out assaying \$98 per ton. The personal property on the Pioneer mine at Angels was sold at auction, Tuesday, to satisfy a judgment.

CAMPO SECO.—Flattering reports still continue to come in from this rising camp. The smelting works are nearly completed, and as soon as they are completed, work is to be commenced on the hoisting works. These mines promise to prove equal to those at Copperopolis in a short time.

WELL SATISFIED.—Colin Campbell, the owner of the now famous Washington mine, went below Sunday. He looks happy and contented, as well he may be. It is not every mine that pays all of its bills from the start as this has done, and there is more than enough in sight to finish the mill.

Humboldt.

THE PRESTON MINE.—Blue Lake *Advocate*, Oct. 3: The people of Blue Lake are naturally interested in the development of the Preston coal mine, on Maple creek. The scene of operations is only about 14 miles distant, and if a good quality of coal should be found there in inexhaustible quantities, the whole county would experience a sort of boom, and our town certainly receive her portion of benefit therefrom. The vein on which work was a few weeks ago begun dips at an angle, with the surface of about 45 degrees. Where it cropped out, the width was only about 2½ feet; but as the workmen descended, the vein grew wider, and it is learned from a gentleman who came down from Maple creek this week that the vein at the depth now attained has a width of seven feet, and there is a noticeable improvement in the quality of coal taken out. The crew is sinking a shaft 6x14 feet, and it is proposed to prosecute operations until the extent of the vein or veins, for there are several, and the character of coal shall have been accurately ascertained. If the coal should prove not first class, and yet make fairly good fuel, it would, if existing in inexhaustible quantities, still be a bonanza for Humboldt county. As a matter of fact, no really first-class coal has ever yet been discovered on the Pacific Coast, and still the deposits in Washington State have proved as valuable to their owners as a gold mine.

Nevada.

THE COE MINE.—Grass Valley *Telegraph*, Oct. 10: Mr. Robert Stevenson is here, and the gentleman is representing the interests of the parties who have bonded the Coe mine. There is general satisfaction all around concerning the looks and prospects of the mine, and just now a crushing is being taken out and will be put through the Crown Point mill. The ore looks well, and the crushing is expected to make a good yield.

MILL STRUCK.—*Telegraph*, Oct. 8: This morning (Thursday) the new mill on the W. V. O. D. mine started up. Everything worked to a charm and the mill will be kept steadily going. There is already enough ore of the best milling quality on hand to keep the mill going for a month or more without hoisting any quartz from the shaft.

Plumas.

THE ARGONAUT MINE.—*Plumas Co. Bulletin*, Oct. 7: Messrs. Foss & Mechin began the development of a drift-gravel mine about three months ago, in Grizzly ravine, near Dutch Hill. During this time they have run a cut and tunnel 100 feet, cutting through the rim and into the bed of a channel. The gravel prospects well, and will pay good wages now for working. They are making numerous improvements preparatory to winter work. This is a section of country which Mr. Mechin has long desired to prospect, being confident that he could find a rich deposit of gold in it.

San Diego.

GOLD GALORE.—*Julian Sentinel*, Oct. 10: The famous Helvetia is sailing under a lucky star. Three weeks ago we had to chronicle a valuable strike in this magnificent property, but to-day the words used on that occasion would ill portray the truth. Two days ago, and while following the rich vein mentioned formerly, and when about 50 feet from the point where the gold quartz first came in, the vein developed a surprising richness, exceeding anything seen in the mine before. In the breast of the drift, at the end of the 225-foot level, there was taken out pieces of the richest ore, some of which same ore will be on exhibition at the county fair, together with samples of the former strike. On the upraise at the point of first contact with rich ore, the men have dug out a distance of 20 feet, and the ore taken out shows no diminution of gold. The first strike was rich beyond the expectations of its owner, but this new find surely places this mine within the limits of a bonanza. The Cincinnati Belle has some wonderfully rich rock in both the upper and lower levels, the 150-foot level being particularly fortunate, and the best rock even here lies at the bottom. Under the direction of W. D. Chambers of the Ruby Company, this splendid property is making great strides. The lower drift is now in about 150 feet, and the ore is getting richer and the ledge widening. About 50 feet of this ledge is now ready for stopping, and ore will be taken out as soon as the necessary cars and other appliances can be had. Mr. Chambers deserves great credit for the work he has accomplished under the many difficulties he has had to contend with.

Shasta.

COAL AND IRON.—*Shasta Democrat*, Oct. 7: Last week a gentleman from Pennsylvania, whose name we failed to learn, came out here with a view of investigating the iron and coal deposits in the Pitt river region east of this city. On inquiry about the discoveries, he was told by some silurians, that the deposits were "N. G.," and that he would waste time and money by investigating. He did not heed their views however, and set out to make a personal investigation. The result was, that he sent some of the ore to his company in the East. They reported that the iron ore contained 75 per cent of iron, and the coal was just what was needed. The gentleman thereupon purchased a large tract of land covering the iron deposits and is negotiating for some coal land. He says if the railroad company will not build a road to the mines, his company will. This will open up a grand industry for Shasta county, and as Redding is the nearest and most practical route to the mines, we will see a second Pittsburg raise up before us before many years have rolled around. With this, and a road running out to Eureka, Redding will become one of the most prominent towns on the coast in a few years.

Siskiyou.

SAWYER'S BAR.—*Yreka Journal*, Oct. 7: Our Sawyer's Bar correspondent, D. C. P., writes us that the gravel mining industry of Salmon river is being reviewed by the contemplated construction of an extensive ditch or canal from the headwaters of the north fork, for the purpose of conveying water along the mountain-sides at a high elevation in order to obtain hydraulic pressure for the profitable working of the extensive high gravel bars that exist all along the course of the river, which have lain dormant awaiting the touch of capital to convert them into paying properties. Wherever these bars have been accessible for even a small amount of water during the springtime, they have been worked very profitably and were thoroughly tested, leaving no

doubt as to the success of the company who have undertaken such an expensive enterprise. Once the success of this company is assured, no doubt other enterprises of the same sort will follow, as the main course of the Salmon is covered with high gravel wash, containing gold in paying quantities, but lacking the capital necessary for utilizing the water privileges for development.

QUICKSILVER.—The new furnaces of the Siskiyou Quicksilver M. Co., located on the west side of Beaver creek, in this county, were finished the first of last week, the castings having been hauled to the mine from railroad via Oregon. The furnaces were soon dried out by building fires in them, and in about ten days more their first cleanup of quicksilver will be made from a large quantity of cinabar on hand. The surface ground in the vicinity has been sluiced off by the hydraulic process, securing a great quantity of float cinabar and exposing several chimneys of very rich ore ranging from 6 to 8 feet in thickness.

BLUE GRAVEL.—Lee, Lash & Co. have found exceedingly rich pay in the blue gravel much higher above the bedrock than in their old shaft, which was totally unexpected. They are sinking down on the new shaft, however, so as to drain the bedrock, which is about 15 or 20 feet lower than the first shaft sunk further up Greenhorn creek. This company, who started again in successful breasting from the new shaft, will take richer pay than ever, as the blue gravel strata containing gold is much thicker and more extensive than at their old stopes and drifts. The Yreka Blue Gravel Co. still continue to find favorable indications of nearing bedrock, where the blue gravel is getting softer and contains gold to some extent. Their shaft is now down about 175 feet, and when reaching bedrock feel confident of striking rich pay. If so, a tunnel will be run into the mountain from Yreka creek to work successfully by running cars into the paying gravel bed.

Tuolumne.

STANLEY.—*Tuolumne Independent*, Oct. 10: The Stanley mine near Jacksonville, under the able management of Mr. Frank McCann, is in active development. It is on the mother vein belt and the ledge is 200 feet in width, with thousands of tons of ore in sight—an immense body. The rock is very similar to that of the famous Utica mine at Angels. Mr. James Tullock, an experienced mining man, familiar with the mines in both counties, thinks the ore is the same or a little better than the Utica. Mr. Tullock has explored the Stanley mine thoroughly, and considers it the biggest thing struck in this county; "one of the biggest prospects I ever saw in my life," said he; "splendid prospect, worth thousands, wish I owned it." He is putting one of his concentrators in this mine. They are now running a tunnel and will have 700-foot backs. It is 2700 feet to the Tuolumne river, and they will have all the water they want, and are now constructing a ditch 16 feet wide, which will be 2½ miles in length. The 10-stamp mill is merely to prospect the mine. If the ore will go \$2.50 to the ton, a 100-stamp mill will be erected at the river. The owners of the mine are San Francisco capitalists. Their success in this mine will insure the development of others.

KELTZ.—The 10-stamp mill of the Keltz mine is running lively and will continue until the water fails. The ore is looking fine. The Leechman Prospecting Co. owns and works the mine and will probably secure others in the near future.

NEVADA.

Washoe District.

CROWN POINT.—Following is a copy of the official report of the pumping operations in the Crown Point incline for the week ending October 3: The pumps have been running steadily during the week. In order to draw the drill rod out of the bulkhead, we lowered the water down to within 20 feet of the bulkhead with the sinking pumps. At 10:30 A. M. yesterday we drew the rod, and the water began flowing into the incline very freely. In a few minutes the water came up within reach of the station pumps. After starting the station pumps, we found that they could hold the water as it flowed through the bulkhead. At 8:30 this morning the water in the Belcher incline had been lowered 6½ feet since the drawing of the rod.

UTAH.—The southeast drift, 725 level, has been extended 42 feet; total length, 456 feet, in hard porphyry showing some clay.

ANDES.—On the 420 level, main north drift was advanced 20 feet; formation vein porphyry and clay. North drift from east crosscut No. 4 advanced 20 feet; formation quartz.

SIERRA NEVADA.—West crosscut No. 1 from the northwest drift, 630 level, 571 feet from the shaft, has been advanced 30 feet; total distance, 1116 feet; no change in formation. The north drift from the Kenosha tunnel was advanced 60 feet through vein formation; total, 80 feet.

UNION SHAFT.—The west drift from the shaft, 900 level, has been advanced during the past week 42 feet; total distance west of shaft 1186 feet; face is in hard porphyry.

WARD COMBINATION SHAFT.—The southwest drift from the shaft, 1800 level, is out 484 feet; face in porphyry and clay.

SILVER HILL.—The northwest drift, 50 level, is out from the shaft 290 feet; the face in porphyry. The south crosscut, 160 level, is out from the wioze 740 feet; face in hard porphyry.

ALPHA.—Are still retimbering shaft.

EXCHEQUER.—There has been no work done during the week on the 500 and 600 levels, owing to the retimbering of the Alpha shaft. The joint southwest drift from the Ward shaft, 1800 level, is out from shaft 484 feet; face in clay and porphyry.

CON. NEW YORK.—The west crosscut (No. 2), 180 feet north of shaft, 650 level, is out 46 feet; face in quartz and porphyry yielding low assays. The north lateral drift, 1100 level, is out north of shaft 712 feet; face in quartz and porphyry yielding low assays.

CHOLLAR.—The east crosscut on the south line, 1200 level, is out 70 feet; face in porphyry and streaks of quartz yielding low assays. South lateral drift from the incline station, 1500 level, is out 155 feet; face in porphyry.

POTOSI.—East crosscut on south line, 1300 level, is out 175 feet; face in porphyry. North lateral drift from winze station, 1400 level is out 122 feet; face in porphyry. The south drift, same level, is out 124 feet; face in porphyry. The south drift from wioze station, 1500 level, is out 38 feet; face in porphyry with streaks of quartz yielding low assays.

The north drift, same level, is out 35 feet; face in porphyry.

BULLION.—The joint east crosscut on the north line, 1300 level, is out 175 feet; face in porphyry. The joint south drift from wioze station, 1400 level of Potosi, is out 124 feet; face in porphyry. The joint southwest drift from winze station is out 38 feet; face in porphyry with streaks of quartz yielding low assays. The southwest drift from the Ward shaft, 1800 level, is out 484 feet; face in clay and porphyry.

AN IMPORTANT CONTRACT.—*Virginia Enterprise*, Oct. 10: The Occidental Co. M. Co., has entered into a contract with the Comstock Tunnel Co., wherein the latter company agrees to run a drift from this tunnel to connect the Occidental mine at a perpendicular depth of 1,000 feet. The drift will be started at a point in the tunnel where it cut the Monte Cristo or Brunswick lode, and will follow the lode through the St. John ground into the Occidental. This drift will prospect and develop a large block of ground that heretofore has been untouched except upon the surface, where the old St. John Co. took out many thousands of dollars in the early days. The work this day commenced is more important to the people of Virginia and the State generally than any mining work that has been inaugurated in this district since the stopping of the Combination pump. The Monte Cristo or Brunswick lode is a well defined mineral-bearing vein extending from the old Monte Cristo on the north and through the Occidental on the south, a distance of over 10,000 feet. Along the entire length, in pipes or chimneys, ore has and is yet being taken out near the surface, and the deepest workings have not reached over 700 feet. The Sutor tunnel has demonstrated beyond all question that this great vein is a true fissure of mineral-bearing rock, and it now only awaits the intelligent expenditure of money and muscle to open and uncover probable bonanzas. The finding of pay ore in the St. John or Occidental at the 1300 level would instill new life into the business of mining in this section. Every claim from the Monte Cristo to the Buckeye would be started, and an additional demand for labor, machinery and mining supplies would be created and every inhabitant in Western Nevada would be benefited. The St. John property has passed into strong hands, and our people are to be congratulated that the money to carry on the work of development has been fully provided by a party of gentlemen whose names alone are a guarantee that the work will be carried to completion in good faith and without delay.

Hawthorne District.

LAPANTA.—*Walker Lake Bulletin*, Oct. 7: Since last report the west drift from the crosscut from the winze below the 100-foot shaft level has been continued, ore still showing in the face. The ore body dips southeast below this drift and appears to be going down very strong. An independent body of ore has been uncovered immediately west of the Old Bradley shaft, and is being stripped ad followed, dipping at an angle of about 25 degrees to the west. It shows from 12 to 14 inches wide for a considerable distance, and will average about \$60 per ton. The body of ore uncovered between the Bradley incline and the mouth of the main tunnel still continues to show well, and during the week some ore which averages \$500 per ton has been extracted.

PAMLICO.—Work is being vigorously prosecuted at five points in the mine, and all points in the vein are showing very well and producing good ore.

CENTRAL.—Stopping still continues above the north drift, 150-foot level, the usual amount of ore being extracted. About 30 tons are now ready for shipment.

Jett District.

LOOK WELL.—Belmont *Courier*, Oct. 10: The mines in Jett district, Nye county, especially the Senator mine owned by Thos. Warburton, look well. A tunnel run on the ledge for 40 feet and intersecting the Senator incline at a depth of 45 feet, shows a regular vein of galena and carbonate ore of good grade. The pay streak is from 12 to 16 inches in width. The last work shows that the ledge for about 300 feet is strong and regular. In running the tunnel, several tons of ore were extracted. In any other part of the country this mine would attract attention of capital.

Jefferson District.

HARRISON.—Belmont *Courier*, Oct. 3: The silver rock from the Harrison mine, Nye county, which was recently hauled to the Sodaville mill for reduction, proved to be good ore. The Harrison Bros. inform us that this ore milled \$334 per ton. There is no doubt that Jefferson is one of the best mining districts in Eastern Nevada.

BRITISH COLUMBIA.

STAMPEDE TO SLOCAN LAKE.—*Nelson Miner*, Oct. 1: Last week Eli Carpenter and Jack Seaton returned from a trip westward from Kaslo creek, having located on the west slope of the mountain some galena ledges. Assays of the ores from these ledges gave results varying from 125 to 175 ounces of silver to the ton. Quartz gangue with but little mineral in sight yielded about 65 ounces. On Monday last Eli Carpenter and E. A. Bielenberg of Ainsworth quietly packed up their blankets and left for the Slocan river by way of Nelson. On Monday night about eight boats and probably twenty miners slipped away under the guidance of Jack Seaton and took the opposite route via Kaslo creek. As there is a little fresh snow on the divide between Kootenay and Slocan lakes, some of the boys will have a chance to "see the elephant" before they return. The rush reminds one of the early days in Cariboo when a new creek was struck in the placer regions. No doubt can now be felt that an exceedingly rich belt of galena and copper ore exist in the mountains between the Slocan and Kootenay lakes.

NOTES.—There is nothing new to chronicle from Toad mountain. The Dandy is reported as looking very well, and the crosscut in the Silver King is said to be in ore, although not of very high grade. At the Grizzly Bear the usual amount of work was done during the week. Several sales are reported, but not of claims likely to be developed into mines. The Poorman mill on Eagle creek has been running off and on for two or three weeks on ore that was extracted last year, and the mill on the Whitewater on Rover creek continues to turn out from \$50 to \$75 a day in gold bullion. Keefer and Monaghan are at work on the Muldoon. The owners of the William Wallace, happy in the belief that "the world is theirs," are doing nothing more than ex-

hibiting specimens of ore from that claim. Prof. Parks has made a second visit to the Gallup-Proctor claims, to the south of Balfour, which makes the owners think there is something in them. Prospectors are coming in from the hills and it is evident that the tail end of the season of 1891 is fast drawing nigh.

NEW MEXICO.

COPPER.—J. T. McCorkle, superintendent of the Anson S. copper mine at Hanover, was in town on Sunday and reports that he has 15 men engaged in development work and piling up ore at the mine. The smelter is not running at present. Mayor Fleming and Hank Dorsey are working the Moonlight mine at Bald Mountain and shipping the ore to the Bremen mill. They have a large body of good grade milling ore and are sacking shipping ore that runs 700 to 800 ounces in silver per ton. Jo E. Sheridan will soon commence work with a large force on his famous Uncle Sam mine in Cow Springs district, extracting ore for shipment to the Bremen mill. Several hundred tons of fair grade milling ore can be extracted easily and cheaply in a short time with a good profit to the fortunate owner. The Aztec Company's mill is running constantly on ore from the Kleptomania mine of that company. The Pacific Gold Company keep their stamps dropping without cessation on ore from their famous Pacific mine. The Bremen mill is running on custom ores and the Flagler works are running on tailings. Silver City's reduction works are the pride and hope of the town.

OREGON.

FROM THE PHOENIX.—Bedrock Democrat, October 1: That the Phoenix mine, situated in the Robinsonville district, is a permanent property is no longer a matter of speculation, but like the majority of other Baker county mines, has proven a permanent ledge. Mr. A. Hector, who is employed at the Phoenix, was in the city yesterday and to a Democrat reporter stated that the ledge had been exposed at a depth of 270 feet and a fine body of ore, four feet wide, was presented to view. The tunnel which taps the ledge at this depth is 250 feet long. The upper tunnel is 350 feet long and taps the ledge at a depth of 200 feet. At this depth the ledge is four feet solid ore and as it has been demonstrated that the ledge is of the same width at 270 feet there is no telling where the ledge ends.

ANOTHER BULLION.—The Democrat was yesterday the recipient of a pleasant call from Mr. F. C. Borden, of the Dierk mine, situated five miles south of Telocast. Of this promising property Mr. Borden said: "The Dierk mine is owned by Borden, Dierks and Toonily, and is a free milling property. We have a 75-foot shaft down the ledge and at this depth a 7-foot vein exposed, which assays \$19 per ton. A tunnel will be run in to tap the ledge at the bottom of the shaft and then we will commence drifting on the ledge. There are 200 tons of ore on the dump, and it is our intention to put up a five-stamp mill early next month. We have a fine mill site and plenty of water. Powder river running within a few feet of the property. This company is also the owner of another ledge in this district known as the Blaine mine. We have done but a small amount of development work, but the property gives promise of proving a valuable copper mine. The ore assays 22 per cent., copper."

IDAHO.

FLINT PROPERTY SOLD.—*Avalanche*, Oct. 3: Last week the deal was closed on the Flint property by the Chicago parties, who held an option on the same; \$600,000 is the price paid. Machinery has been ordered by wire, and the capacity of the mill will be largely increased. What the policy of the company will be we are unable to say, but we understand that Mr. Leech's services have been secured as general superintendent, and as soon as possible more men will be employed. The success of the Flint milling process, introduced by Mr. Leech, has led to numerous inquiries by capitalists, and a number have been making personal inspection in the South Mountain district, which is also a base ore camp. We may look for a stir in that district before many months. The Trade Dollar property is improving, and has continued to improve for some time, until now the ore has gotten to be so near the pure stuff that all it lacks is the eagle stamped on it. Of course Supt. Dewey is highly elated, as well he may be. Development work is going on all through the mine. The Seales and Wagner arrastra started up this week on Cumberland ore. This is one of the recently developed properties on War Eagle, and gives promise of being a banana. Two teams are now hauling ore from the Phillips & Sullivan mine on Florida to the Silver City reduction works. The mine is looking finely in all the workings and is a steady bullion producer.

MONTANA.

MINERS AT WORK.—As a source of information, with some little trouble and as near as could be arrived at, the following is about the number of men that are actually employed in the principal mines of the camp at the present time: Anaconda, 30; Mountain Con., 4; St. Lawrence, 9; Green Mountain, 2; High Ore, 25; Wild Bill, 35; East Colusa, 2; Mountain View, 100; Harris and Lloyd, 107; Silver Bow, East, 16; Gray Rock, West, 10; Sisters, 15; Butte Copper Company, 12; Lexington, 50; Alice, Magna Charta, Blue Wing and Silver Safe, when in operation, 150; Eveline, 1; Goldsmith, 12; Modoc, 6; West Colusa, 40; Leonard Shaft, 40; Moose, 16; Silver Bow, West, 100; Gray Rock, East, 80; Josephine, 20; Ground Squirrel, 40; Gleggarry copper shaft, 12; Moulton, 45; Gleggarry, 40; new shaft on the Silver Lick, 14; Gambetta, 40; Blue Bird, 80; new shaft on Blue Bird, 12; new shaft of the Nettie, 14; Parrot Colusa, 50; Gagnon, 80; Moscow, 25; On Butte, 6; Parrot, 80; Nettie, 80; Germania, 30; Virginus, 24; Belle of Butte, 30; Puland, 6; Pacific, 14; Homestake, 6. There are many leasers that are not enumerated that will about double the above number, and that is a rough estimate of the whole number of miners employed in the district at the present time.

The Temescal tin mine is said to be turning out about eight tons of tin a month.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 6, 1891.

- 460,738.—CAN LABELING MACHINE.—H. Albert, Crescent City, Cal.
460,691.—AUTOMATIC VENT.—M. Anthony, Berkeley, Cal.
460,740.—FRUIT STONER.—J. S. Briggs, San Buenaventura, Cal.
460,914.—CONVEYER.—J. M. Finch, Crockett, Cal.
460,915.—BOLTING MACHINE.—J. M. Finch, Crockett, Cal.
460,820.—DOOR OPENER AND CLOSER.—Julius Finch, S. F.
460,724.—FINGER-BEAM ATTACHMENT FOR HARVESTERS.—H. P. Galligan, Wheatland, Cal.
460,821.—APPARATUS FOR MARKING STONE PAVEMENTS.—G. F. Gray, S. F.
460,864.—ELECTRIC SWITCH INDICATOR.—E. W. Hadley, Corvallis, Ogo.
460,748.—PASTRY SHELF.—Mary S. C. Hartmann, Redding, Cal.
460,812.—WAVE-POWER MOTOR.—H. P. Holand, S. F.
460,814.—CONCENTRATOR.—Gustav Lang, S. F.
460,757.—HORSE COLLAR AND HARNESS.—D. Paquet, Oakland, Cal.
460,758.—WATER-WHEEL.—J. B. Pitchford, S. F.
460,815.—WATER-WHEEL.—J. B. Pitchford, S. F.
460,831.—IRON OR STEEL POST.—W. E. Pedley, Prescott, A. T.
460,729.—APPARATUS FOR FEEDING SAWDUST AND SHAVINGS TO FURNACES.—Scott & Shear, Mott, Cal.
460,763.—FLOP BOARD FOR BOLTING DEVICES.—J. A. Segbers, S. F.
460,732.—ORE SEPARATOR.—H. H. Taylor, Fresno, Cal.
460,733.—ORE FEEDER.—Jas. Tulloch, Angels, Cal.
460,736.—MECHANICAL MOVEMENT.—Williams & Lash, Sacramento, Cal.

The following brief list by telegraph, for Oct. 13, will appear more complete on receipt of mail addresses:

Pacific Coast: California.—Mathew Arnold, San Francisco, elastomer for belts; Edward A. Cochran, Pasadena, combination tool; Jean B. Gerber, San Francisco, bipedodermic aerial railway; Ernst Krebs, San Luis Obispo, game apparatus; James McKee, Oakland, preserving lumber; Albert Minnick, Colton, San Bernardino, ventilating device for railway cars; James Portocous, Fresno, cultivator; William C. Roberts, Sausalito, newspaper holder; Daniel W. Smith and J. K. Hopkins, Fresno, dirt scraper; Martin M. Worburger, Round Mountain, hay-raking and elevating machine, Washington.—Fred McKinley, Acme, culinary boiler; Isaac H. Odum, Oakdale, extension ladder.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FRUIT-STONING MACHINE.—John S. Briggs, San Buenaventura, No. 460,740. Dated Oct. 6, 1891. This is an apparatus for cutting fruit and removing the stones or pits therefrom, it being especially applicable to such fruits as apricots, peaches, plums and the like.

MECHANICAL MOVEMENT.—Chas. H. Williams and T. M. Lash, Sacramento. No. 460,736. Dated Oct. 6, 1891. This invention relates to that general class of mechanical movements which may be properly termed "tread powers," in which the operation is dependent upon a continuously moving weight, such as a horse or other animal. The objects of the invention are to provide a simple, effective and economical power device, and to utilize the peculiar movement for the purpose of amusement in toys, and instruction in educational appliances for schools for illustrating the movements of orbital bodies. The device may be used for a power device for driving machinery for pumping water, etc.

CAN-LABELING MACHINE.—Henry Albert, Crescent City, assignor of one-third to Thos. R. Hayes, Pasadena. No. 460,738. Dated Oct. 6, 1891. This invention relates to that class of can-labeling machines in which a reciprocating can-puller and pasting mechanism operates within a runaway, as exemplified in the machine shown and described in the patent to the same inventor, No. 445,418, granted Jan. 27, 1891. The invention consists of certain improvements on the former machine. The general object is to provide a simple and effective machine for labeling cans, and which can be readily adjusted to suit the requirements of different sizes of cans.

CONCENTRATOR.—Gustav Lang, S. F., assignor of one-half to Livingston Gilson and Julius Jacobs. No. 460,814. Dated Oct. 6, 1891. This is an improved ore concentrator. It consists of conveying sluices with means for subdividing the flowing material and grading it progressively through the different parts of the apparatus in such a manner that the heavier particles are separated from the lighter, until nothing but waste or worthless material is left to be discharged. The great difficulty in concentrating and saving the very minute and light valuable particles, which are usually carried away with the water and waste material, makes the percentage of loss very considerable. The object of this invention is to progressively separate and convey away, first, the slimes and clayey matter from the heavier subphurates, metals and sands; second, to grade and deposit these heavier substances in strata in a pan, with a means for drawing off each different grade until every possible portion has been saved and separated from the waste material.

FLOP-BOARD FOR BOLTING DEVICES.—Joseph A. Segbers, S. F. No. 460,763. Dated Oct. 6, 1891. This invention is designed to provide a novel

flop-board, as it is called, for flour-bolting devices. These flop-boards are fitted into a channel or trough beneath the bolting reel, so that they may be shifted and change the flow of the material falling into the trough, to either one of two screw-conveyors, one of which is situated upon each side of and below the trough. In this invention the flop-boards have circular grooves in their opposite ends, which fit segmental guides so that the boards are easily shifted from side to side upon these guides and they form close joints with the rails against which they abut. Vertical partitions separate and grade the material as it falls from the bolting reel into the trough or channel, and either grade may be carried off by the screw-conveyors.

FINGER-BEAM ATTACHMENT FOR HARVESTERS.—Hugh P. Galligan, Wheatland, Yuba Co. No. 460,724. Dated Oct. 6, 1891. This invention is applied to headers in which a draper platform is located at the front of the machine, its forward side being formed and bounded by the finger-beam in which the reciprocating sickle works. The object of this attachment is to enable the sickle to cut the entire length of the finger-beam. In the present machine this is not the case, as the last finger through which the sickle passes is not at the end of the finger-beam by about a foot from it and the cutting of the sickle stops at this last finger. There is, therefore, a loss of a foot approximately at the end of the finger-beam, and the machine does not cut a swath as wide as its beam is long. In the ordinary machines the last finger is set back from the end of the beam for the reason that the draper roller is mounted between the beam and back-bar at that end, and the supporting block of the swath-board must be far enough inside of the line of this roller to allow the board to lie with its inner edge over the draper, so that the cut grain will fall upon said draper.

COMBINED HORSE-COLLAR AND HAMES.—Dimdonni Paquet, Oakland, assignor of one-half to Louis Kaser, No. 460,757. Dated Oct. 6, 1891. This invention consists in the combination with the body of the collar, of a hame, which also forms the roll, and in a peculiar means for jointing or hinging these hames, so that the collar may be opened at the bottom to place it on the horse's neck, and a locking device for securing it when it is closed together.

WATER-WHEEL.—John B. Pitchford, S. F. No. 460,758. Dated Oct. 6, 1891. This is one of that class of wheels in which the buckets are carried on the rim of the wheel and receive the impact of a stream from a nozzle under head or pressure. The objects of the invention may be generally stated to be increased capacity and a widely varying range of power. The first object is attained by bringing a large number of streams to play on the buckets at one time, and the second is gained by changing the number of streams and size of the nozzles to suit the quantity of water available.

ORE FEEDER.—James Tulloch, Angels Camp, Calaveras Co., assignor of one-half to David C. Demarest. No. 460,733. Dated Oct. 6, 1891. This patent covers an improved construction of the inclined tray or chute movable beneath the open-bottomed hopper in which the ore is placed, and in certain details of construction and adjustment. In former patents issued to Mr. Tulloch in November, 1873, and March, 1875, he showed a feeding tray and a means for reciprocating it beneath an open-bottomed hopper; but in each of these inventions certain details in mechanism and operation of the device were shown which differ in construction and operation from the present invention, and upon these differences he bases his claims for improvement.

APPARATUS FOR FEEDING SAWDUST AND SHAVINGS TO FURNACES.—Thos. T. Scott and Jacob J. Shear, Mott, Siskiyou Co. No. 460,729. Dated Oct. 6, 1891. This is an apparatus for feeding sawdust, shavings and other waste from instruments used in the manufacture of lumber or wooden articles to furnaces, where it is burnt. The device acts rapidly and economically, distributing the fine inflammable material with evenness and regularity, and the blast of air furnished causes it to burn with extreme rapidity. It is especially useful in saw-mills and other mills for working lumber in large quantities, and in which it is a serious matter to dispose of the waste. It is burned in pits or furnaces, the slabs and heavy material being brought to the furnace by a conveyor above the sawdust feeder, and the sawdust is distributed over the larger pieces by this machine, which also supplies air for combustion.

PASTRY-SHELF.—Mary S. C. Hartmann, Redding. No. 460,748. Dated Oct. 6, 1891. This invention relates to a novel construction of pastry-shelves and it consists of a series of shelves and a support or adjustment therefor. When the device is in use it may stand in a closet or any suitable place, and pies or other kinds of pastry may be placed on the shelves. When the device is out of use it may be reduced in space by taking out the shelves, separating the sides by unhooking certain rods and the sides, shelves and hooks hang up in small compass.

WATER-WHEEL.—John B. Pitchford, S. F. No. 460,615. Dated Oct. 6, 1891. This is one of that class of water-wheels in which the buckets upon the rim of the wheel receive the impact of a stream of a stream of water under head or pressure. The novelty lies particularly in a peculiar nozzle for directing and regulating the stream. It consists of a nozzle pipe fitted to a water coupling and having a cylindrical seat with a front port, an oscillatory plug fitted within the cylindrical seat and having a tapering part which forms the water exit or nozzle, and a stem connected with the plug for turning it. When the plug is turned down, the stream is taken partially out of or wholly under and clear of the buckets, thereby regulating the speed of the wheel. By turning the plug still farther down, its port is moved out of line with the port in the seat, and the stream is shut off altogether. Thus a perfect control of the wheel is possible.

APPARATUS FOR CUTTING OR MARKING ARTIFICIAL STONE PAVEMENTS.—George F. Gray, S. F. No. 460,821. Dated Oct. 6, 1891. In the customary operation of cutting or marking artificial

stone pavements it is usual, after the top dressing or layer is in place and while still unset, to place a straight edge upon it in the line in which it is intended to be cut or marked, and then with a trawl-point or other instrument to follow the straight edge and thus cut or mark the work and shape the groove. Besides the time required in laying off accurately and separately each line to be cut or marked, the old operation is further disadvantageous in that the straight edge, pressing only on one side of the cut or mark, causes the top layer or dressing on the other side to bulge up and separate from the coarse or bottom layer, thereby making the work defective in the particular technicality known as hollow. Mr. Gray now uses certain novel frames, which apparatus overcomes the disadvantages of the old method by insuring rapidity and accuracy and at the same time avoiding hollow work by preventing any separation or bulging of the top layer because during the entire operation of cutting and subsequent forming or shaping of the cut the material is pressed equally on both sides.

Mining Share Market.

Mining shares the past week had all the symptoms of going to pieces, but did not. The pool succeeded on Monday in quoting an advance of about five per cent over Thursday's quotations, after which, through cross orders they dragged them down to, on an average, about ten per cent. In the downward, sickening movement the pool must have gained stock, notwithstanding the big bull points put out by, so says report, the Levy-Harmon consolidation. It is needless to say that the latter is a bull on Savage and Hale and Norcross, but why it is desirable to sell \$75 and \$20 (the price many have the two stocks to go to) stocks at less than \$3 a share, is beyond the writer's knowledge. Who knows but the suits against the two mines have considerable to do with the desire to sell? It looks very much like it, for the management of the Savage mining company appears to be fighting to get all the time possible before letting the suit come to a trial, possibly in the meantime to unload their stock. The companies that give the most encouraging news from the mines are the Savage, Hale and Norcross and Con. Virginia. The first two have suits either against the company or else the officers, while the last-named mine is liable to have its right to the west workings contested at law at an early day. Notwithstanding the many drawbacks, the writer believes that an up move is near at hand, so as to make the shorts fill and sell, if possible, some stocks. Outside mining shares are still dull, although toward the close there was more doing in the Tuscaroras. For several weeks an accredited broker for the Tuscarora pool has been a quiet but steady buyer of the stocks at declining price.

After years of litigation, the Comstock (formerly Sutro) tunnel appears to be settled and now the development at depth of the various lodes in that district is in order. The extension through the Savage ground of the tunnel to the west should be inaugurated at an early day. This work would settle the west lode controversy.

In the case of M. W. Fox vs. O. C. Steel for an order restraining O. C. Steel and others from voting certain stocks of the West Con. Va. and California Mining Co., Judge Levy denied the order on the grounds that the plaintiff had a better remedy.

The hearing of the case of M. W. Fox vs. the Savage Mining Co. for an injunction to prevent the milling of ores by the Nevada Mill came up before Judge Hebbard on October 13th. Owing to the persistent, if not obtrusive objection made by the attorneys for the Savage Company, Judge Hebbard refused to hear the order, and thus the Savage Company get a few more days' time before the order to show cause will be assigned to some other department.

The suit against the Hale and Norcross management is set for trial on the 17th of next month.

Fears are expressed that both the Savage and Hale and Norcross Mining Companies will run through the Comstock tunnel, the high-grade ore known to be in the two mines, and call it waste rock. The idea of Levy-Harmon Consolidation doing anything like this, particularly if they are liable to be caught.

In Belle Isle, Tuscarora District, on the 450 level, they have penetrated the downward continuation of the high-grade ore found on the 350 level. This is considered very important. In Navajo and two other of the mines, important work is being done. From the Bodie district, our advices indicate that the mill will start up soon on Bulwer ore. In Bodie, important developing and prospecting work is being pushed ahead. Probably after the assessment is delinquent, it will be made public. In Mono, considerable secret work is reported; but how true this report is, we are unable to learn.

From the Comstock mines our advices report an improvement in Con. Virginia on the 1800 level. That the management can run into good to high-grade ore at any time desired is an open secret among mining men, yet it looks as if it is the intention before closing to develop the various levels extending from the 800 (on this level very high grade ore was found far to the west) down to the 1800-foot level. The work in Ophir, Mexican and Sierra Nevada is being closely watched by mining men. Developing and prospecting work is still under way in Best and Belcher, Savage, Hale and Norcross, Potosi, Con. Imperial, Challenge, Confidence, Belcher and Kentuck. From Yellow Jacket and Crown Point reliable advices of the work which it is said is being done is hard to get. The water in the Gold Hill mines is being steadily lowered by only one pump; the other is held in readiness for work if the one now in use gets out of order. Active work ought soon to be commenced in these mines below the water level. There is good to high-grade ore on several levels in these mines, but whether the public will get the benefit from its milling, or get the usual assessments, remains to be seen.

Mining shares opened this (Thursday) morning at lower prices under better business. After the regular call they rallied some, but closed weak under strong bear points and a general belief of still lower prices soon. There is a growing impression that a big quarrel is brewing on the Comstock between the managers of the Gold Hill mines and those of the Middle and North End mines. It is claimed that the Comstock Tunnel Co. movement is the first entering wedge in the rumpus.

MECHANICAL PROGRESS.

Mechanical Evolution.

The term evolution is nowadays employed to denote a slow, progressive unfolding, or growth and describes in a very complete way the history of all important machines and processes in industrial development. This evolution is not an ideal matter; on the contrary, it is a business one, that must be taken into account the same as taxes or an expense account. Every improvement of any importance comes down to a standard of "common practice," through a course of evolution.

At the present time we are busy with steam expansion; doubles, triple and quadruple engines, with high boiler pressure. If one looks back for half a century, the evolution of this matter assumes a tolerably regular sequence, not so much of discovery as adaptation. It is a quarter of a century since Perkins began his experiments with high-pressure steam. Wolf, much farther back, introduced the second cylinder. Sixty years ago regular compound engines were made and fitted into steamers in Holland. The drawings of these engines have recently been reproduced in England and published in the *Engineer*.

On the Ohio river 40 years ago there were compound engines. The Hawkeye, that was sunk about 1848, by her fly-wheel breaking, had compound engines. The Clippers, No. 1 and No. 2, lasting from 1846 to 1856, had compound engines, set tandem, so had the Memphis, a New Orleans and Cincinnati packet, 35 years ago. Her engines were about 16 and 24-inch bore, the cylinders set tandem. They were called then Clipper engines, from the name of the first boat fitted up in this manner on western waters, and were in all essential respects the same as compound engines are now made. The pressure employed was nominally 150 pounds per inch, when the "chief" did not hang too much weight on the safety-valve. In that case the pressure was uncertain, and rose rapidly if an opposition boat was seen ahead.

It is more than 15 years since John Elder of Glasgow was in the heat of battle with his competitors over the compound engine problem, and it is ten years or more since Mr. Galloway of Manchester, England, constructed a quadruple expanding engine for a cotton mill there, and was laughed at for committing such a vagary. The rule of "evolution" in such things is inexorable. There is no escape from it except on the principle of "proceeding in haste and repenting at leisure."

Mr. A. S. Hallidie's first cable railway in San Francisco was constructed in 1873, 17 years ago. Since then there has been concentrated on this subject the best efforts of our ablest engineers, spurred on by the incentive of a great public want and ample facilities. Now, at the end of this time, we find ourselves changing, modifying and improving with scarcely one feature or detail settled in any definite way. A new type of cars is just being tried, a new system of turn-tables has been adopted, the traction gearing is widely varied, the cable conduits are taking various forms, and little of the old appliances remain. We can see many years more of evolution before the cable system of propulsion assumes what is called standard practice.—*Industrial World*.

Chemical Principles in Boilers.

In the manufacture of boilers, according to a recent writer, the observance of certain chemical principles in respect to the metal employed is an essential consideration. Thus, a metal with high conductive properties should be preferred to one possessing it in a lesser degree; the thickness of the sheet should not be excessive; the polish of the exterior surface should be very slight, and, if it is desired to prevent the heat from radiating from the surface of the boiler or steam cylinder, they should be covered with some poor conductor, like wood charcoal, earthy matter, felt, etc., and then by some high reflector like polished iron, copper or brass. It is known that, when the heat-rays from any source of heat—strike a body, one of three things may follow, either they penetrate into the mass, and are absorbed, or they pass through it, or they are stopped at the surface without penetrating, and are either reflected back in the direction whence they came, or, by making the angle of incidence equal to the angle of reflection, pass off in an oblique direction. Polished surfaces and those with a clean color are usually the ones that reflect heat with the least amount of absorption, and of these, mercury stands in the front rank, and brass comes next, while tin, steel and lead are the reflectors, having only three-quarters the efficiency of brass. White reflects, while dark and dull colors absorb heat, as do also wood and earthy substances. These properties, whether radiating, absorbing or reflecting, have therefore, important practical relations to the choice of iron for boilers.

EARLY HISTORY OF IRON MAKING.—A late number of the *Scientific Monthly* contains the first of a series of articles upon the above subject which will, no doubt, be of much interest in bringing many facts before the intellectual class of readers, such as will be likely to widen the general field of intelligence, and pave the way, among scientific men, for enlarged views of the iron business, and in so doing promote

valuable improvements in its manipulation. The history of crude iron in the United States says a cotemporary is in itself an interesting study; but taken in connection with the enormous present consumption of the products of iron and steel, and their universal adoption in the great enterprises of the world, it reads like a fairy tale squalling if not surpassing the fables of Arabian dreamers, in point of wealth and the surprising effects evolved. The study of iron and steel manufactures leads directly to that of the wonderful invention and skill displayed in the machinery and appliances necessary for the evolution of the one into its most costly, finished products, and it is in this department that one meets with the greatest results of mechanical perfection. The more the subject is investigated the more importance it assumes. The fact is patent that the general public knows too little of these things, and turns from them on account of the technicalities which surround them. What is needed is the introduction of plain accounts of the origin, history and operations connected with these branches of industry into common schools and colleges, into the homes of practical mechanics, into manual training schools, into every shop and furnace where one becomes iron, iron turns to steel, and steel into buildings, ships, bridges, viaducts and all the great engineering works of the day. The phrase of "Iron is King" is no senseless electioneering cry—it is a truth.

MALLEABLE IRON.—Malleable iron castings are made in dry or green sand molds that do not differ materially from ordinary cast-iron moulding. The iron is poured very hot and the product is a shiny, gray, highly brittle casting, these characteristics being principally due to the selection of pig iron. The castings are then taken and put into square boxes, where they are embedded in oxide of iron, mostly in the form of iron scale purchased from rolling mills. The boxes are put into furnaces and gradually raised to a high temperature, the limit being only short of the melting temperature of the iron under treatment. The higher the temperature maintained, the better the product. The boxes are kept in the furnace seven or eight days and then allowed to cool slowly. As soon as the castings can be handled, they are ready for cleaning. There is considerable difference of opinion among metallurgists as to the rationale of the process. The prevailing opinion is that the decarbonizing material, when kept at a high temperature, removes from the part of the iron penetrated the carbon, sulphur, silicon and manganese by a process of oxidation. An eminent chemist, however, who has given the subject profound study, attributes the change in the physical properties of the castings after treatment to the separation of amorphous graphite within the metal, without which separation he holds that the castings will remain brittle when the amount of carbon is decreased to the usual extent. By this as it may, the practice of cementation with oxide of iron on the proper castings produces a very tough casting that is filling a highly important place in American industries.

THE VOLATILITY OF IRON.—Herr Fleitmann's experiments in soldering iron with nickel have yielded some important results with regard to the volatility and atomic penetration of the former metal. The adhesion of the two metals was so intense that it became impossible to separate them by mechanical action, and chemical analysis proved a perfect assimilation, although the soldering had been effected at a temperature of from 500° to 600° below the fusing point. Other tests established the volatility of iron when heated to cherry redness. Two plates of iron and nickel, superposed, were submitted to the same degree of heat; the iron passed into the nickel to a notable extent without soldering or adhesion of the surfaces resulting. On the whole surface of the sheet of nickel an alloy was formed with the iron, which, in the case of one millimeter sheets, penetrated to 0.05 of their thickness, and contained on the average 24 per cent of that metal, the proportion being naturally stronger on the surface. An important fact is that the passage of the iron to the nickel is not reciprocal. While the combination disclosed itself on the surface of the nickel plate by the argentiferous luster of an alloy of iron with 50 per cent of nickel, the iron plate remained intact, and preserved the somber appearance which it had received from the scaling. The volatility of iron in this instance still awaits an explanation, and it is not known if it is to be attributed to traces of cyanide, chloride or carbide of iron. In any case, the exceptional welding properties which iron possesses in comparison with other metals must depend on a partial volatilization at a temperature much below the fusing point.

A COMPARATIVELY NEW MACHINE for use among the shoe manufacturers is the automatic change stitch. It is a one or two needle machine, and is designed for closing seams, making lining, tape staying and putting on tips. It is said to be of a simple and economical nature, and thus far has been operated most satisfactorily.

A MIGHTY SYSTEM.—The Santa Fe system of railroads, as it exists at present, is one of the grandest railway combinations on the continent. The total mileage of railroad now owned and controlled by the company is 6444, and to these figures must be added the railroads controlled jointly with other companies, making the aggregate 7704 miles.

SCIENTIFIC PROGRESS.

The Blue of the Sky.

Every one admires and talks of the blue of the sky, and every one has noticed that it is of a deeper and richer blue at one time than at another; but who can give the cause of this constantly recurring change?

In seeking for this cause, M. Crover has reported to the Paris Academy of Sciences the result of his systematic observations of sky color from December, 1889, to December, 1890.

He finds that the sky is most intensely blue in December, January, March and September, and paler in July, August and November. Observing the changes from hour to hour, he found that it was more deeply blue in the morning than during the heat of midday. This indicates that, since the deepest color is seen, generally speaking, in the coldest months and during the cooler part of the day, heat is an important element in determining the depth of the sky color.

This recalls one of the most brilliant of the many experiments with which Professor Tyndall used to illustrate his lectures. By projecting a beam of electric light into a cloud of invisible particles of vapor in a glass vessel he was able to imitate the finest azure tints of an Italian sky.

The point of the experiment was to show that the sky tint is caused by the reflection of the blue waves of light from minute particles floating high in the air. The waves of blue light are shorter than those of yellow or red, and consequently are more easily arrested and reflected back.

When the sun is blazing hot high in the heavens it dissolves the fine particle of vapor to a great extent, and leaves fewer of them to split up the scattered daylight and send its blue beams back to the observer's eyes.

It will be easy and interesting for any person to observe for himself the variations in the color of the sky. Perhaps new facts may thus be discovered that men of science will be glad to learn.—*Garrett P. Serviss*.

SCIENTIFIC CRANKS.—The world is much indebted to what are sometimes called "scientific cranks" for many of its comforts and conveniences. Every time we strike a match, says the *Aluminum Age*, we are indebted to the men who have studied science for the mere love of it. The men that worked away at coal tar "just to see what was in it" made the whole world their debtors by discovering alizarin, the coloring principle of madder, and to these men the world is indebted also for aniline, antipyrine, and more than 100 other coal-tar products. Scientists, wondering what was in crude petroleum, found paraffine and vaseline. Pasteur wondered what caused fermentation. He found out and brought a new era to wine-making. The singing and dancing of a teakettle attracted the attention of a brain, and we have as a consequence all the applications of steam. The swinging of a chandelier in an Italian cathedral before the eyes of young Galileo was the beginning of a train of thought that resulted in the invention of the pendulum, and through it to the perfecting of the measurement of time, and thus its application and use in navigation, astronomical observations, and in a thousand ways we now pass by unnoted, has been of such practical value that the debt to scientific thought, even in this one instance, can never be known. Science, in its study of abstract truth, is ever giving to man new beginnings. While the devil is engaged in finding mischief for idle hands to do, science is eternally at work finding something useful for them to do.

CURIOUS RAILWAY MAGNETISM.—*La Nature* notes the following curious and interesting phenomena: Two railways, one the Sceaux line and the other the Ceinture, pass within a comparatively short distance of the Montsouris Observatory, Paris, the former line being about 80 meters distant and the latter but some 60 meters. During the passage of trains on the Ceinture line, which is nearest to the observatory, the bifilar magnet is found to be disturbed and its oscillations are registered photographically; indeed, the movements are so regular that the curve clearly indicates the exact time of each train passing the observatory. This phenomenon is due to the fact that, as the line crosses the direction of the magnetic meridian, the wheel tires of the carriages become magnetized by induction, and so produce, in consequence of the laws of magnetism, a deviation of the bifilar magnet. The trains on the Sceaux line give rise to a phenomenon not less curious. Whenever the engine driver blows off steam, the electrometer is partly discharged, the electrical potential of the air falling to about one-half its original value. These disturbances are brought forward by the Director of the Paris Observatory in order to oppose the scheme which is now proposed of extending the railway from Sceaux to the Place de Medicis.

THE LABRADOR SCIENTIFIC EXPEDITION.—Early last spring, Bowdoin College sent out a scientific expedition to explore the almost unknown interior region of Labrador, under Prof. Lee as chief. This expedition has met with most satisfactory results. It has fully solved the question of the existence and grandeur of the Grand Falls of Labrador, a subject which had hereto-

fore been a legend to the scientific world. This waterfall is higher than Niagara, and replete with grandeur. The fall proper is only 200 feet high, but the short rapids above this increase the total altitude to 500 feet. It is the first scientific expedition made to these falls, and the full report is looked for with interest. A race of Mont Agnais Indians has also been found—the first discovery of that race known to a white man.

Civilizing Influence of Railroads.

The beneficial influence of the railroad is not confined to commercial benefits alone; it affects as well the civil, moral and intellectual relationship of communities wherever it goes, whether of small or large areas. It reaches out even to international relationships, and is already manifesting most important influence on the general character as well as commercial interests of nations. Wherever the railroad appears, isolation, and all the prejudices which such condition engender, as in China, is rapidly finding its way into the ash pit of history. Japan has been quite disenthralled from its sleep of centuries. China is already feeling the life-giving influences of this great modern civilizer, and is just now in the throes of a moral and industrial revolution. It is true, as recently remarked by a cotemporary, that nations now are neighbors, and notwithstanding all political jingoism to the contrary, it is becoming an economic and historic fact that as we shorten distances and develop commerce, we reduce the possibilities of misunderstanding and rupture. In this kind of evangelization the railroad has been one of the most vital and important factors. It has done much and is destined to do more. The steel rail will yet be a planetary institution. It is annexing the globe, and when complete, will radiate from the equator to the poles. It is just 24,000 miles round the waist of Mother Earth, and when the Bessmer girdle is complete, some 20,000 miles can he traveled in a palace car. From New York and other Eastern points we can travel to San Francisco, thence to Alaska, can cross what will be but an ocean ferry to Siberia, and on to China and India. The gorges of Afghanistan will pass in panoramic grandeur before the traveler as he glides along to Russia in Europe; Berlin, Paris and London will be scheduled in the same time table, and an Atlantic trip of five days will see the cosmopolitan American in sight of the Hudson. It is simply a question of time, and in less than two decades will probably be an historic fact. The Siberian railway is being pushed with vigor, and the American link, missing in Alaska, will, without a doubt, be supplied in a few years, and the railway map of the planet be complete.

TWO CHARACTERISTICS mark the age. One is a restless curiosity to study the hidden pathways of being, to illuminate darkness, penetrate mysteries. It is the age of microscope, telescope and spectroscopic. The eager quest of the scientific spirit is seen in natural history, physiology, literature and religious and political history. Tradition can set no limits to the pursuit of truth, and no one now dares to brand this earnest curiosity as irreverence or infidelity. But another spirit is equally manifest. It is the frank confession of the limitations of human knowledge, the impossibility of clearing up the mysteries which lie beyond the domain of our knowledge. There is an agnosticism in philosophy and theology which stands out in strong contrast to the theological dogmatism which had mapped and published the whole plan of the universe. Of the two, agnosticism is more modest and cautious. Both of these characteristics, the earnest search for truth and the patient acknowledgment of human limitations, are necessary; but, for the pursuit of truth, faith is necessary to impel our curiosity, and hope is necessary to turn our doubt and ignorance into trust and expectation. Agnosticism as an intellectual trait, may be but one aspect of modesty and candor; but as an emotional trait, it is negative and hesitant, and needs to be reinforced by the sentiments of hope and faith.

THE PRODUCTION OF POLLEN.—The immense number of pollen grains produced by a single flower apparently militates against the saying that Nature allows nothing to be formed but what is needful. It seems, indeed, a vast waste of material to have such a multitude of grains when so very few would answer the same purpose. In a single flower of the peony there are about three and a half million grains. A flower of the dandelion is estimated to produce nearly two hundred and fifty thousand. The number of ovules in a flower of the Chinese wistaria has been counted and the number of pollen grains estimated, and it is found that for each ovule there are seven thousand grains. While few fall below the thousands, many rise far above the peony in point of numbers. These are the wind-fertilized flowers, and here Nature must provide for an immense loss of material.

CHEMISTRY is to a large extent an empirical science, and the chance experiment may lead to greater results than could with our present data be derived from the closest study or the keenest reasoning. The most important chemical discoveries from the first manufacture of glass to the whitening and refining of sugar have mostly been due to some happy chance which might have befallen a mere dabbler as easy as a deep student.

ELECTRICITY.

An Electric Road from Napa to Calistoga.

Under the above head-line the Napa Journal of a late date publishes the following information, which it is to be hoped is reliable: "It is rumored that steps will soon be taken by several prominent citizens of this county, assisted by San Francisco capitalists, to construct an electric railroad from tide water at Napa to Calistoga, a distance of 28 miles. Early in October a committee appointed for that purpose will wait on an electrical construction company in San Francisco, and will receive and ascertain estimates as to cost, etc. It is proposed to construct the road early in the spring. Cars will be used for freight as well as for passengers. When the road is completed it is proposed to start cars every hour to Calistoga, from which place also cars will leave every hour. The rate of fare at first will be about one cent per mile per passenger. The cars will carry light freight and produce at a great reduction from the price now charged on the railroad." A method of travel affording frequent trips either way is the only thing wanting to make Napa Valley one of the most desirable localities for homes of the wealthy.

THE PHILOSOPHY OF ELECTRIC WELDING.

According to Professor Elihu Thompson, it is not the extra resistance at the break that gives rise to the heating in electric welding. The imperfect contact there, no doubt, hastens the heating at the joint, but a solid bar placed between the clamps of an electric welding machine can also be raised to the welding temperature. The real cause of the concentration of the heating between the clamps is the relatively greater conductivity of other portions of the welding circuit, which is usually composed of massive copper conductors, kept cool in the case of large work by the circulation of water. By keeping the conductors cool in this way, their resistance is maintained constant, and an accumulation of heating effect follows at the joint where the rise in temperature increases the resistance. In large works, it has been found that hydraulic power can be advantageously employed both for clamping and making contact with the pieces to be welded or worked. In dealing with metals such as lead, tin, zinc, the temperature required for welding is so low that the metal never glows, and the progress of the breaking cannot be watched with the eye. By properly shaping their ends, leaden water pipes can easily be welded together end to end. The meeting edges should be thinned so as to reduce the surface of contact below the area of the pipe wall. Joints thus made are very good and sound. Most metals can be welded without the use of a flux, but for good work a flux is often desirable.—London Iron.

NEW ELECTRIC MINING APPLIANCES.—An Eastern contemporary, in referring to Edison's new mining appliances on exhibition at the Montreal Electrical Exposition, says: Great interest has been manifested here in the new Edison electric mining appliances exhibited at the Electrical Exposition. The most striking of these is the electric percussion drill, which will bore at the rate of three inches per minute in the hardest granite. It requires but little power to operate, and can be worked any distance from the dynamo to a limit of three miles. The drill is very simple in construction, having no moving parts except the plunger, and nothing that will be affected by moisture. The device, it is said by experts, will completely revolutionize mining work. The next in importance is the diamond prospecting core drill, designed for locating mineral deposits. It will bore 150 feet to the earth, bringing out a specimen of the mineral for the purpose of determining its value. Some have likened this drill to the mythical "divining rod," which was supposed to indicate the location of minerals. The Edison drill certainly resembles such an invaluable instrument. Aside from these are exhibited electric coal drills, electric hoists, electric fans and electric pumps, showing that Edison has turned his attention in earnest to mining work, and many are expecting marvelous results from this branch of electricity in the near future.

ELECTRIC LAUNCHES ON THE THAMES.—The number of electric launches on the river Thames, near London, is constantly increasing. They will soon equal the number of boats using steam on that river. The most of these boats are using stowage batteries, and so great has become the demand in that direction, that to meet the requirements, a floating charging station has been built. In appearance it is very similar to a house boat. The charging station consists of a river barge, 80 feet long and 14 feet beam. The machinery is placed in a compartment at one end, and consists of a semi-portable steam engine plant and dynamo of efficient output to charge the accumulators on six launches simultaneously. The remaining portion of the boat contains a store room, an office, sleeping apartments for the attendants, and an engineer's room, where a lath is fixed, and attendants are kept constantly in readiness to effect any repairs to launches which may be required, or convenience boat owners know how to appreciate.

LONG-DISTANCE POWER TRANSMISSION.—The comparison of efficiencies of various methods of

transmitting power to a distance has long since demonstrated the superiority of electricity for the majority of cases occurring in practice, and involving the utilization of natural forces. But far more than any other method, the electric method permits of a wide range of conditions of working, and to select those which will result in the most economical operation has by no means always been an easy task in the past. In an elaborate discussion of this subject, Mr. H. Ward Leonard, in this issue, shows the relation to one another of the various factors which enter into the solution of a problem of this nature, and the results obtained by him, as exhibited in the charts, will, we are certain, be welcomed by every one interested in electric power transmission. Much of the discussion on this subject has been confined merely to a consideration of the cost of conductors. While this item is, no doubt, a large factor in the equation for economy, it is not by any means the only one, and it is therefore desirable, as pointed out by Mr. Leonard, to have a handy means of comparing all the factors without elaborate calculations.—*Electrical Engineer.*

ELECTRICITY FOR MINING PURPOSES.—No body knows better than mining engineers the difficulty of transmitting power from the pit's mouth to machinery at the bottom of the shaft. Steam is largely used, but this limit is soon reached at which it can be economically transmitted. The loss by evaporation is enormous, and as fires cannot be permitted in the mine, steam power, owing to the distances at which the hoilers have to be placed, is often out of the question. The best substitute hitherto has been compressed air. Numerous compressors are erected and work on the surface, and the air is forced down pipes to the positions required for use. It is found by practice not more than 30 or 40 per cent efficiency is obtained in its use. The cost of running strong pipes from the surface to distant parts of the mine is something enormous, but for want of a better system of power of transmission it has had to be done. Mine owners everywhere are watching most carefully the results of electric plants in connection with mining operations, and if they once learn the future to answer the purposes as well as they have done thus far, electrical engineers and constructors will soon have an enormous addition to their orders.

GIANTIC ELECTRIC RAILWAY SCHEME.

From time to time rumors of immense, improbable and sometimes impossible schemes reach us from the United States, and it would seem that the continent is now about to tread in the same path, and that Brother Jonathan is not to have all his own way in the matter of startling enterprises, notwithstanding the novelty that he already possesses in the railroad on pine tree tops, which forms a prominent feature of the landscape in a certain part of Sonoma county, California. The project is being seriously discussed in Naples of building an electric railway in that city 100 metres (nearly 350 feet) above the level of the streets. Veritable towers, higher than the first platform of the Eiffel structure, would support the rails; passengers would ascend by elevators; while the motive power it is proposed to utilize a fall of the Sereno. Although this would be the highest and most unique railway of its kind in the world, we are unable to understand the object of the projectors, nor do we think that the capital would be forthcoming for a scheme which in all probability would prove unremunerative.—*London Iron.*

WIRE ROPE VS. ELECTRIC TRANSMISSION.

In the third revised edition of *Electric Transmission of Energy*, the author, Gishert Kapp, a leading English electrician, inventor and writer, makes the following statement regarding the relative merits of wire rope and electric transmission: "It pays to transmit cheap water power by wire rope if the distance is less than a mile, and electrically if the distance is a mile or more. This applies to all powers. It pays to transmit cheap steam power if the amount of energy required at the receiving station does not exceed ten-horse power. If the distance is less than a mile use wire-rope transmission, for distance of one and upward to two or three miles use electric transmission. Beyond this limit a small local steam or gas engine is preferable."

SPEED OF ELECTRIC SUBMARINE CURRENTS.

Recent experiments made at McGill College, Montreal, under the auspices of the British and Canadian Governments, to ascertain the longitude of Montreal by direct observations from Greenwich, have led to the determination of the length of time a telegraphic signal takes to cross the Atlantic. Out of 200 signals sent, it was found that the average time taken to cross the Atlantic and back again—about 7000 miles—was a trifle over one second.

AMERICAN ELECTRIC ENGINEERS IN SPAIN.

Mr. Morton Edward Eden of the Brush Electric Co., Cleveland, O., has been called to Europe to superintend some heavy electric railway construction in Spain, to be put in by an English concern.

RESPIRATION OF PLANTS.

While plants are taking in carbon and throwing out oxygen, they are at the same time, though only to a slight extent, doing exactly the reverse, taking in oxygen and throwing out carbonic acid. This is very similar to the act of breathing in animals.

GOOD HEALTH.

The Sour Stomach Remedy.

Our readers will recollect the article published in our issue of Sept. 12th, on the plant *Leuconthemum*, as a substitute for bicarbonate of soda, for sour stomach, water brash and heart burn. The publication of that article has brought the following response, containing much further valuable information in regard to the malady referred to, and also illustrating the value of the Press as an advertising medium.

Boston, Mass., Sept. 22, '91.

GENTLEMEN:—The article on "Sour Stomach," came duly to hand, and the results are on me in a postal shower.

The day after I received a copy of Press with my article in print, I had five letters in the first mail, from all over the country; one from Brooklyn, N. Y.; one from Minneapolis, Minn.; one from Denver, Colo.; and two from California. The next day there were four in the morning's mail, and one in the last mail that was Saturday. Monday brought five in morning's mail, and in the evening's mail five. The evening's mail gets here at 4:30 and the morning's by 8:20. The orders are filled and mailed in the morning by 10:30, and in the evening before supper, at six o'clock. I send herewith a copy of my Health Pamphlet, No. 9, (a flesh-brush circular) just as prepared by Dr. Cemmings and corrected by me.

Many Disturbances in the Digestive Tract Arise from a lack of soda in the blood—soda having been eliminated in removing carbonic acid from the blood, as an alkaline carbonate, its (CO₂) presence in the blood being due to skin inaction through contracted capillaries and these contractions arise from a need of more nerve force that is obtained by an increased flow of blood to the head through arterial tension, produced by the contracted capillaries of the skin.

The old method of taking soda as a carbonate or a bicarbonate is of little or no value, as in that form it is a neutral compound, as Nature forms it in the body—a waste product to be at once removed, and requiring nerve force to remove it.

How to Use Soda.

To be of service in the body, soda should be in combination with a freely digestible substance, either as we find it in Nature, combined with albumen in work or as prepared with citric acid or malic acid. I prefer the former, and prepare it thus: To the expressed juice of a good-sized lemon, in a large tumbler, I add an even teaspoonful of the ordinary cooking soda (bicarbonate of soda), and stir till the effervescence subsides (that the tumbler is now full of an irrefragable gas can be seen by dipping a lighted match into the tumbler, when it will be extinguished by the carbonic acid present in the form of a gas); then pour off the gas, and if the juice is now a mild acid or nearly neutral, fill up with hot water (otherwise add more soda before the water). If, after filling with water, there should be an alkaline taste, more lemon juice could be added, till you have a pleasant emollient drink that will refresh the body and nourish it too. Soda is the most important of all the elements of the body, as it is always associated with albumen in work, in serum, blood corpuscles, lubricating fluids of joints, fascia, tendons, arterial and venous walls. In arthritis, the lime is carbonated; in atrophy of muscles, potassa is carbonated, and all from a retention of carbonic acid at the skin. You see the far-reaching effect of skin inaction in the withdrawal of important elements of the physiological work of the body.

But these ill effects are not so readily seen or felt as are those that arise from arterial tension; the list of troubles run through anæmia, apoplexy, arteria, asthma, etc., to the end of the alphabet, and it is always the weakest part that suffers, as it is in a community the poorest devil goes to the wall.

There is no need of Sir Morrill Mackenzie's theory of "poisoned nerves," as set forth in Good Health column, Press, July 25, 1891, when each far-reaching result comes from a deprivation of vitality that closes the pores of the skin, contracts its capillaries and causes trouble generally.

Perhaps you wonder why I am writing. Well, I thought there would be at least 50 letters in this morning's mail, and there were none.

I had steam up and must write or burst. I have packed a few *Leuconthemum* plants, just to let you see how I send them, and so that the white dulse may be seen around your home if you want them. They will show what flowers whiten many fields here in the East. Yours truly,

Geo. F. Waters.

THE CORE OF CANCER.—Several of our interlopers, in referring to the articles which we have published from time to time on the cure of cancer in this city, have asked us for the name and address of the practitioner who cures this malady. The name has been repeatedly given in these columns, but we don't repeat it every time we make reference to the subject for the reason that these articles are not intended as advertisements for the doctor, but are written with the hope of calling attention to the matter as to secure for the same a proper medical investigation. The unwillingness of the medical faculty to accept

of any truth which does not come *ex cathedra* has thus far hindered our efforts in this direction, but we are still hopeful that the severe ethics of the profession will yield to constant calls of humanity for an investigation into a matter which promises to be of such vast benefit to suffering humanity everywhere. One of the latest of these requests which has come to hand is from the *Farm View*, published at Porterville, Tulare county, which says: "If there is any disease in which the specialist should be a blessing to the race, it ought to be in the case of cancer. If Mr. Ewer will give the name and address of the party who performs the cancer cures he speaks of, he will only be performing a public duty." The name of the specialist referred to is Dr. A. S. Cook, 224 Post St., San Francisco.—W. B. E.

ENGINEERING NOTES.

The Whaleback Steamer.

Another American Marine Triumph.

The "whaleback" steamer, so-called, which was recently built on the shore of Lake Superior, loaded with grain and sent to sea via the Lakes and St. Lawrence, arrived at Liverpool in 14½ days from Montreal, a most remarkable and unusually short passage. The steamer is called the Charles H. Wetmore, and is the first Lake-built steamer which ever crossed the Atlantic.

Several Clyde-built steamers have made the passage, but they have been so constructed as to be out in two and taken through the canals which pass around the rapids, in sections. The C. H. Wetmore was constructed in an altogether different manner. She was too large to be taken through the canals, and hence was obliged to "shoot the rapids," which she did, owing to her peculiar construction, with perfect ease and safety.

Several schooners have been built on the Lakes and taken through the canals, but they are too small for heavy traffic, and, moreover, totally unsuited to compete with steamers in any carrying trade.

Of course, such steamers as the C. H. Wetmore cannot make the return trip to the Lakes and it was not intended that she should. She will go from Liverpool to Puget sound on this coast, and enter upon the coal trade between the Sound and this city.

This style of steamer was considered doubtful in regard to her sea-going qualities, but her passage across the ocean has proven not only her practicability as a sea-going vessel, but also her superior qualities over most other sea-going steam craft.

This important marine achievement has attracted much attention on both sides of the Atlantic, and so well has she accomplished her purpose, that English agents of coal-bearing steel barges have expressed the opinion that the future steam collier, if not all cargo boats, will be built on the general lines of this craft.

Is it a New Monitor?

A contemporary, in alluding to this new American marine triumph, says: As has been stated by one connected with the building of the whaleback steamer, that the achievement of that vessel was not in having carried a cargo from Lake Superior to Liverpool, but in having demonstrated that in the heart of North America there can be built a steel vessel of safer construction, cheaper cost of operating, and greater proportionate carrying capacity than any other vessel in the world. Good marine authorities have pronounced the whaleback vessel the best all-round water carrier yet devised, and in the opinion of some it is the future war vessel!

While it may be rather early to predict certain success for this new marine construction, it is certain that from a ship yard on Lake Superior there have gone out four steel vessels that are a revolution to English shipbuilders. At one period in our history an American establishment in a few days produced a war vessel, the first appearance of which showed the nations of the Old World that they were entirely without naval defense. It may be that the victory of the Monitor in war will be paralleled by the new type of American ocean carrier in the more glorious achievements of peace.

A NEW BOAT PROPELLER.—This is a new and simple device patented by Mr. Charles E. Fox of Minneapolis, Minn. It is designed not only to propel a boat with great facility, but to afford the operator the very desirable advantage of going face foremost. The device is readily applicable to any row boat. The primary object is to run the boat by a screw propeller, the shaft of which passes through the stern of the boat through a packed hearing, the shaft being inclined slightly so that the propeller wheel is submerged. At a suitable point in the boat is a vertical yoke frame secured to the bottom of the boat, the frame carrying at its upper portion a double crank shaft provided with a central sprocket wheel. Below this is journaled a second shaft carrying a sprocket wheel and a bevel gear wheel, which engages a horizontal bevel that turns a short vertical shaft which is journaled in a step bearing below. This shaft, by bevel gear, causes the screw shaft to rotate. This arrangement is much more satisfactory in every respect, and will enable the boat to be propelled in very narrow channels, and the excursions will also be beneficial.



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W. B. EWER.

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SAN FRANCISCO:

Saturday, October 17, 1891.

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See Advertising Columns.

Passing Events.

Several shocks of earthquake have been felt along the upper coast region of California this week, and while one of them was rather long-continued, it was not very violent, and no damage was done. The center of activity seems to have been between Napa and Petaluma.

A project is on foot to interest the general public in assisting the Lick Observatory, and will be brought before the Regents. It is proposed to organize a society of contributing members, who would be entitled to receive the bulletins and reports issued by the astronomers, as well as reproductions of the lunar and other celestial photographs being made. The observatory has not sufficient funds for publication of its reports.

It is thought the gap on the coast-line railroad between Elwood and Olivio will soon be closed. Some very extensive tunnels must be cut, and railroad officials are now inspecting the ground.

The librarians of the United States are in session in this city this week. The visitors are being received and entertained by the local librarians and citizens interested in library matters.

The big company at Cracker Creek, Oregon, is to resume operations and put in a larger reduction plant. The "cyanide process" is to be used. The closing down of the Eureka and

Excelsior Cons. Companies was a bad thing for Oregon's mining interest, and this starting up again is an important thing for the State.

Asphaltum and Bituminous Rock.

California leads all the States of the Union in the production of asphaltum and bituminous rock, and the industry is constantly growing. The various semi-solid bitumens, all known as asphaltum, comprise gilsonite, elaterite, uinitite, wurtzite, albertite, grahamite, asphaltum, maltha and hrea. These differ considerably from one another in their chemical composition, in their action with acids or other agents, and upon the application of heat, but asphaltum is the common term applied to the mass.

The bituminous rock is a sandstone impregnated with asphaltum and is very abundant in various counties in this State. Some 50,000 tons a year are now used, and new deposits are being opened, it having come prominently into the market as a competitor with other kinds of material for street paving.

A census bulletin by E. W. Parker gives the statistics of production of this material, and states that the capital invested in the business is now \$2,651,500, including land, machinery, tools, etc.

Although for a number of years asphaltum in its different forms was known to exist in California in large quantities, it was not until 1888 that its production assumed any important proportions as an industry. In that year, a large deposit of material containing a large percentage of asphaltum was found in Ventura county, and a company was organized in this city to develop and operate it. It contains about 24 per cent of "fixed bitumen," which increases its value beyond any material of like character found in this State.

In fact the material from this deposit is now being used not only in San Francisco, Oakland and other California cities, but in Seattle, Portland, Denver, Salt Lake, Chicago, Omaha and elsewhere. Another deposit nearly as good is found in Santa Barbara county. The material is heated and mixed with sand when it is used. Sand is mixed in the proportion of three to eight times the bulk of sand to one of the asphaltum. This method effects a considerable saving in transportation expenses. Once properly mixed and laid, it seems practically indestructible, as shown by many instances where it has been put in use and subjected to heavy traffic. There is no appreciable loss of time in placing it on the street as it soon "sets" and is ready for traffic.

This material is locally known as "Stradmant pavement," and large quantities are being mined and utilized for street pavements and sidewalks.

There are several deposits of bituminous rock in San Luis Obispo and Santa Cruz counties, in which the peculiar features of asphaltum formations are strikingly illustrated, clearly showing that they belong to no particular age or era; that they are found at various altitudes, and with no uniform character or appearance, hardness or chemical composition. Deposits of solid asphaltum and springs of viscid, oily material, commonly called "hrea," occur in places not a thousand feet apart, and yet in strata of unquestionably different periods of formation. A number of companies are now engaged in its production.

The bituminous rock of San Luis Obispo and Santa Cruz counties is a sandstone thoroughly impregnated with bitumen. It is used almost entirely for street paving, and for that purpose is probably more easily and cheaply prepared than any of the asphaltum products. The only treatment necessary is to steam it, so as to thoroughly mix its ingredients and soften it for spreading to a uniform thickness and a smooth, even surface. Bituminous rock has supplied a limited local demand for 10 or 15 years, but it is only during the past three years that it has assumed any commercial importance as an industry. Pavements made of this material 15 years ago and used under heavy travel have recently been removed and found to have lost very little either in weight or thickness; also that it stands equally well the high temperatures of the interior cities and the cold, damp atmosphere of the coast.

Until the remarkable impulse given to the asphaltum industry in California and Utah in 1888, the island of Trinidad and the deposits of Seyssel, France, and Val-de-Travers, Switzer-

land, furnished the bulk of the world's supply.

Although the production of bituminous rock in California, and of gilsonite in Utah have assumed proportions of commercial importance, with indications of much greater activity in the near future, the island of Trinidad continues to be the main source of supply for the United States. In the Eastern cities, Trinidad asphaltum is used for street paving to the almost entire exclusion of other kinds. This is due entirely to its advantage in cost of transportation. The railroad freight rates from the Pacific Coast practically shut out the bituminous rock of California from competition in the Eastern States, and a similar condition may be said to affect the sale of Trinidad asphaltum in the cities of Europe, since the bituminous limestones of Val-de-Travers and Seyssel, having the advantage in freights, control the markets. The cost of preparing the different varieties of asphaltum for street pavement is nearly the same, and as all appear to be about equally durable, the exclusive use of any of them is due merely to the advantage in freights.

Margin Trading to be Tested.

A few days ago Barrett & Co., stockbrokers, sold at auction in the San Francisco Stock Board rooms, a line of mining shares for account of a lady customer, Mrs. W. N. Wetmore. The firm rendered an account of the sales and also a statement of her account, neither of which she would accept, and now brings suit against Barrett & Co. for the sum of \$3380 for money paid. This suit is brought under a recent decision of the Supreme Court, declaring that under the Constitution of this State the dealing in stocks on a margin is not legal, and virtually declares that all moneys lost can be recovered from the broker or brokers who buy and sell on margin.

The lawyers on both sides of the case are said to be well up in this particular line of their chosen profession, and consequently the suit is attracting considerable attention, not only from mining share brokers and dealers, but also from bankers and others directly or indirectly interested in all classes of certificates.

It is to be hoped that points will be drawn out which will definitely settle the vexed question what margin trading is, and also, if it can be legally done, by substituting an agent for the principal without a written agreement signed by both parties and recorded as an evidence of good faith on the part of each. Aside from this consideration, it is held by a large class of persons that the transactions or dealing in mining shares or other securities can be made legal by the broker or brokers having the certificate or certificates put in the purchaser's name, and being in her or his name, and so recorded in the transfer book of the mining company, constitutes the person for whom the broker bought, the bona fide owner, and as such the latter can get an advance on the shares from the broker or any one else disposed to lend money on such security. This practice, if generally followed by brokers, would make dealing in mining shares legitimate and rob it even of the suspicion of being a species of gambling.

THE CHILI BAR SLATE QUARRY, El Dorado county, has been constantly developing for the last four years. A large force of men is engaged at work there. This company owns some 40 acres of land, which is like the majority of the land in the county where the slate industry is being carried on, as on every side rise steep hills of solid slate. The wall at the entrance of this quarry is now over 100 feet in height by 100 feet in width, this allowing ample room for work to be carried on. Slate has been shipped from this quarry to more than a dozen different counties in the State, and already the net proceeds from the sale of slate is \$25,000.

ELECTRIC LIGHT AND POWER.—The San Antonio Electric Light and Power Company has gone to work in good earnest to give the city cheap lights. They have commenced work in San Antonio canyon already to develop their water power, and by the 1st of January, or a little later, they expect to be ready to deliver light and power to order at Pomona, Ontario, San Bernardino and all towns in that valley for incandescent lights. They will only charge one cent per hour, and only for the hours the lights are actually used.

Comstock Mine Management.

EDITORS PRESS:—Can you inform me where and how the Gould and Curry Mining Co. has spent the assessments collected during the past year, amounting to \$120,000, and over?

For many months past, that portion of the superintendent's weekly report which you publish, has referred to work being done in the "grass roots," i. e., on the 200-foot level only, with two or three exceptions, when the 400-foot level was barely mentioned. Why have the lower levels been abandoned?

Does it denote good mine management and honesty of purpose for the management of this mine to spend \$120,000 on and above the 400-foot level, granting that they have explored the mine to any extent between the 200 and 400 foot levels?

The writer is glad to note the very just criticism which the managements of some of the Comstock mines are receiving from your paper. The course pursued by the managements of these mines to enrich themselves at the expense of the stockholders would not be permitted in any other business enterprise in this country, wheresoever located, and it is the province of the MINING AND SCIENTIFIC PRESS, and all other respectable newspapers to expose the corrupt methods employed by the several managements, and, if possible, to secure and furnish the evidence necessary to punish them. —A NEW YORK SUBSCRIBER AND STOCKHOLDER.

[In conforming to the wishes of our correspondent, a representative of this paper visited the Gould and Curry office, and found that only two assessments, of 30 cents per share each, were levied in 1890, aggregating \$64,800, and two of a like amount in this year. Regarding work in the mine, official weekly letters from the mines report that all work done is on the 200 to 400 levels. The only mention of work done on any other level is made in the annual report of the superintendent in November, 1890, wherein he states that on the 625-foot level, they had made connection with the Savage north drift, whereby they had secured good circulation of air for developing and prospecting work.

As our correspondent suggests, it does seem to be poor management for all work to be confined from year in to year out on three levels, particularly when it is a matter of record that the well-known superintendent "Jim" Ruhe received \$5000 about four years ago for discovering to the west, lower down, an ore body in the mine similar to the one he found in Con. Virginia, and over the division of profit from the same, he and Senator J. P. Jones had a lawsuit, which was compromised out of court. —EDS. PRESS.]

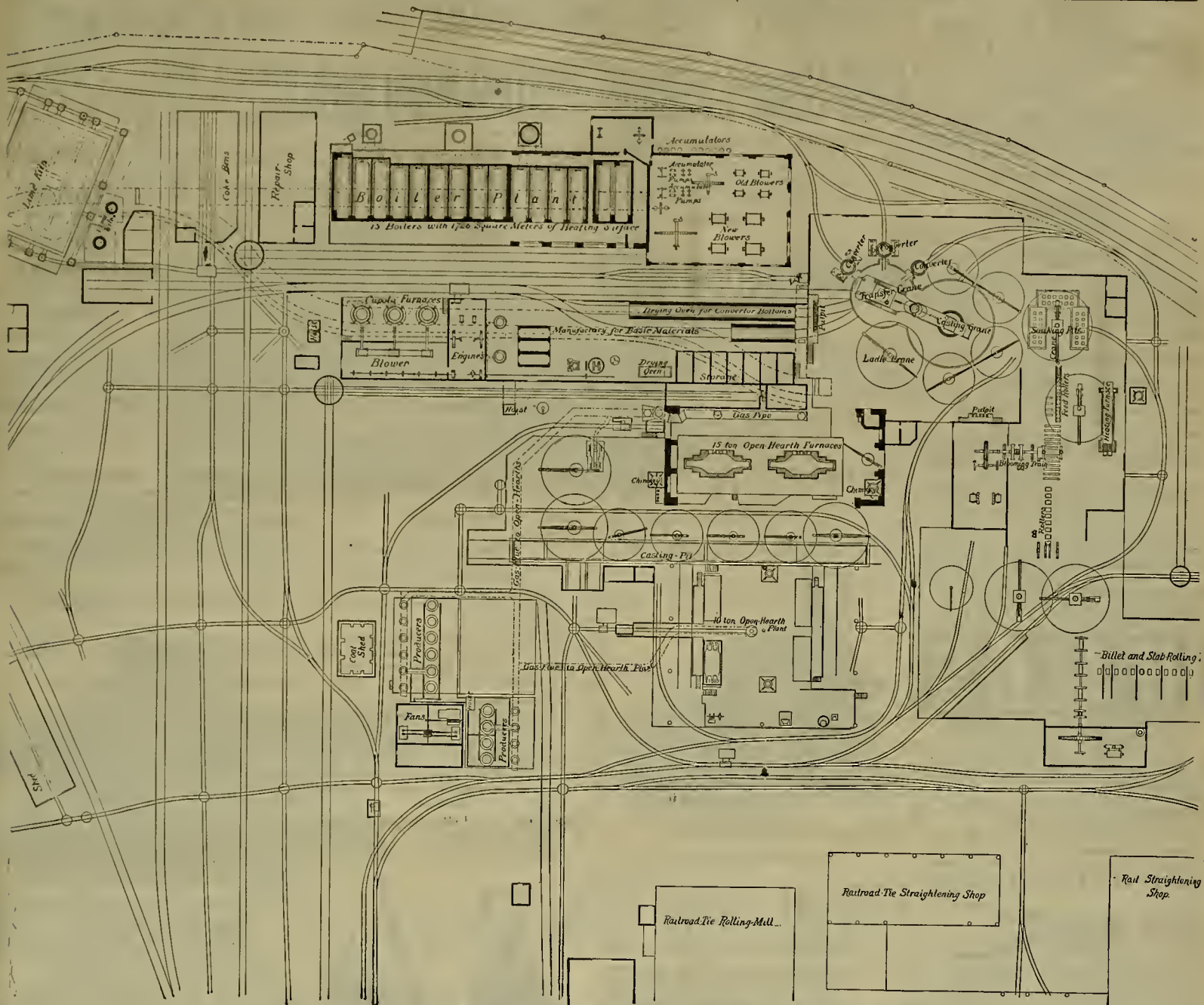
THE WORLD'S FAIR.—The California World's Fair Commission is still waiting the decision of the Supreme Court as to whether the State really appropriated any money at the last session of the Legislature. Until this is ascertained the California Commission can do little. They have, however, ordered the cutting of the three trees to be sent to the forestry building. The trunks are to be 20 inches in diameter and 25 feet long, and will be used as columns to support the colonnade. There will be a redwood from Santa Cruz, a sugar pine from Shasta and a sequoia from Tulare. The only expense will be in packing and transportation, leading millmen having volunteered to donate the trees.

A TRAFFIC ASSOCIATION.—The merchants of this city are organizing a traffic association, the object of which will be to secure better rates from railroad companies. Quite a general interest is manifested in the mercantile community and the association is expected to accomplish much good and enlarge our business field.

GOLD NUGGET.—A gold quartz nugget of the value of \$1,400 was found on Monday afternoon lying on the bedrock in the Washington mine at Iowa Hill, Placer county. It had lain there for a long time and many people had walked over it. Experts say this is one of the handsomest nuggets ever found in the State.

THE LICK OBSERVATORY, California, and the Prague Observatory, Austria, are now working together in lunar and stellar photography. The Lick has the largest photographic lens of any telescope, while the Vienna Observatory excels in enlarging and photogravure work.

DR. ELLIOTT CONES, who has for many years been one of the scientific workers in the Smithsonian Institution, is visiting the Pacific Coast to regain his health. He has been for some years at work on the Century dictionary.



GENERAL VIEW OF PHOENIX STEEL WORKS AT RUHRORT, RHENISH PRUSSIA.

Steel Works.

In last weeks PRESS engravings were given from Dr. Wedding's paper before the American Institute of Mining Engineers showing the Phoenix converter plant at Ruhrort, Rhenish Prussia; and this week we reproduce a drawing showing a general plan of the arrangement of these works. They were built in 1884. The necessity of filling in the ground of the whole plant to a depth of eight meters increased considerably the difficulty of providing proper foundations, and led to the design of the lightest possible iron construction for all buildings. Space is limited and hence the general arrangement which is shown in the engraving.

Direct metal from two blast-furnaces, producing 6000 metric tons a month, can be run to the converter-house by a locomotive. The same track also serves to bring in the remainder of the pig, which is melted in three cupola furnaces. At Phoenix, the Thomas pig carries 2 to 2.4 per cent phosphorus, 1.8 to 2.3 manganese, 0.2 silicon, 2.8 carbon and 0.02 to 0.07 sulphur.

The three converters are served by one central charging and transfer crane and by an independent casting-pit. The central crane takes the charging ladle from its truck and raises and swings it. Two men on the upper platform of the crane empty the ladle into the converter. The crane is then lowered, and the blow begins as the vessel is righted. The second arm of the same crane is ready to receive the casting-ladle. Ferro-manganese is thrown into the converter from the platform of the transfer crane. After a completed blow, when the casting-ladle has been picked up by the transfer crane, the latter swings into line with a casting

crane, which, in turn, takes the ladle and does the pouring, while the transfer crane is prepared to handle a new heat. The 1200-kilo ingots taken out of the moulds are charged into soaking-pits which are not specially fired. Thence they pass to the blooming-train, and, after that, are out up with heavy shears. The blooms are either sent to the billet or plate-mill, or go to other rolls for working up into a great variety of shapes.

The height of the three cupolas to the charging-door is 5.4 meters, the diameter at tuyeres is 1.4 meter, and that of the shaft 1.8 meter. The level of the hearth is 2.4 meters above the floor. Each cupola melts 35 metric tons per hour, with 700 to 800 millimeters of water-gauge blast-pressure. The two blast-furnaces deliver, in 12 hours, 80 to 90 metric tons of molten pig, which is blown without admixture of cupola-metal. The converter-charge is 11 tons, and the greatest record for 12 hours is 33 heats, or 315 tons.

The monthly output amounts to 12,800 tons. The duplex blowing-engine is fitted with expansion valve-gear, takes steam at 90 pounds, and delivers blast at 27 pounds. For the hydraulic machinery there are ten air-accumulators. The capacity of the mill amounts to 325 metric tons in 12 hours; 12,600 tons of blooms a month are rolled. The transfer and casting crane have each a central supporting column and two cylinders, one for the live and the other for the dead load. All motions, including the swing, are produced by hydraulic power, controlled by an operator on the crane. The same is true for all the soaking-pit and shear-crane, an operator being stationed on each. Piston valve-gear is used for all hydraulic valve-motions,

Green Oil in California.

Most of the mineral oil obtained in this State is what is denominated "black oil." The black oil of California is quite different from the green oil of the Eastern States, where, with a single exception at Lima, Ohio, which is quite different from California oil, no black oil has been discovered. Green oil, after distillation, leaves a light-colored residue well known as paraffine, which is of a soft, plastic consistency and of great value in the arts. Black oil, after all its volatile constituents have been thrown off, leaves a hard, black residuum popularly known here as "maltheine." The "asphaltum," which is so abundant in California, and which is now being largely used for street-paving, is simply "maltheine" largely mixed with impurities.

This new oil strike in Fresno may be considered one of much importance. It certainly will help it is followed up by other similar discoveries.

The Pacific Coast Oil Co. has for a long time had an oil at Newhall, Los Angeles county, called Pico crude, which is a green oil. It has been refined for the past ten years. When the oil field in Alma, Santa Cruz mountains, was being worked, they produced an oil known as an amber crude. These, so far as we are informed, are the only oils with a paraffine base known in this State, all the other oils having an asphaltum base.

The Fresno strike was made at a depth of 300 ft., and is reported to consist of a 10-barrel flow of pure green oil. It is worth on the market \$4 a barrel, while the common oil brings but about one-quarter that amount. In addition to that, this oil is capable of being refined,

while most other California oils cannot be refined to much profit. They are chiefly used as fuel and for making gas. Natural gas is also found near the well in such quantities that by capturing it as it issues from the fissures in the ground, the workmen are enabled to secure a sufficient quantity to run the machinery for operating the drills and pumps.

HUMBOLDT COUNTY COAL.—A dispatch from Eureka, Humboldt county, Cal., says: Analyses of the coal specimens found on Maple creek show a high proportion of carbon, the highest of any coal on the coast. Bituminous shale in the same locality gives nearly 50 per cent of volatile carbon. These facts have occasioned considerable excitement, and several tracts of land on Mad river have been leased and bonded during the last few days. Their development is progressing in several localities.

MINING LITIGATION.—The great mining suit of the Bell, one of the Chambers syndicate group of Anaconda mines, vs. the Speculator, has commenced at Helena Montana. The case involves over half a million dollars, and is for the ores extracted in the disputed ground. The Speculator people have been operating through a shaft, drifts and levels on an ore body which the Bell people claim is theirs and that it dips into the Speculator.

NO TOWER.—It is not thought probable now that there will be any tower at the World's Fair. The projectors of the most promising tower scheme abandoned it when they found that they would have to take down their tower when the exposition closed, because the Park Commissioners refused to grant any subsequent use of a site.

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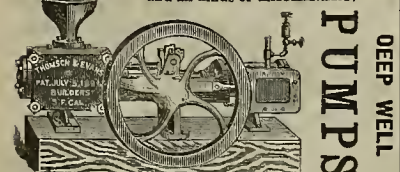


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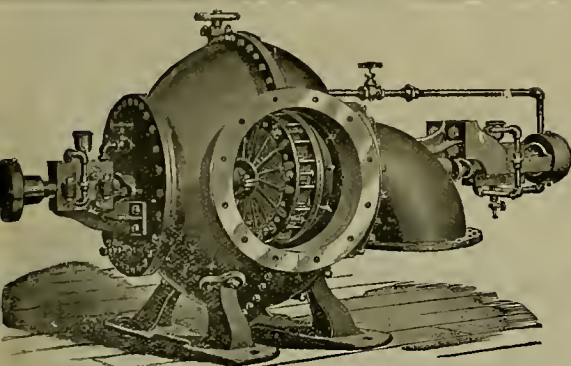
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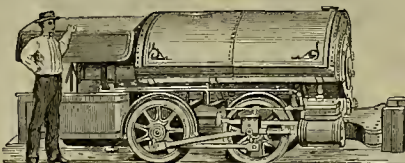
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 15, 1891.

Business continues to enlarge, with the volume of goods going out increasing. The low prices ruling for coal, coke and iron are greatly in favor of iron workers, for it admits of their competing for work which usually goes to the Central and Eastern States. Money continues in liberal supply, and now that two of our leading banks, the California and Nevada, have had their annual meetings, they will be in better shape to accommodate their patrons and others. If last year's profits of these two institutions be accepted as a fair index of the profits and standing of the various banks in this city, then our banking institutions are in most excellent condition. Last year's profits of the bank of California aggregated \$584,776, and those of the Nevada Bank, \$347,000.

MEXICAN DOLLARS—The market hangs around 77 cts. The demand is fair, and the supply is large.

QUICKSILVER—Receipts the past week aggregate 127 flasks, and exports by sea, 646 flasks to Mexican ports. The market has strengthened under a good demand and stronger holding. Some sales are reported as high as \$45.

BORAX—Receipts the past week aggregate 282 cts. The market while strong is not quotable higher.

The borax bed near Ellensburg, Wasb., is said to be 18 feet deep and 50 per cent pure. A railroad is needed to develop this material. The road, however, when built from Port Eaton, will necessarily pass near the beds; 380 bbls. of borax were received the past week from Port Orford.

LEAD—The market shows a weaker tone, with buyers disposed to bid down. Cannery men are out of the market. At the East a stronger selling is reported.

TIN—The market is very dull and heavy, with concessions obtainable on a firm offer. The political campaign at the East has developed a full crop of, to call them mildly, exaggerators. It will be sometime before the true status of the industry in this country will be known.

LIME—Receipts the past week aggregate 2,223 bbls. The demand is only fair, but prices continued steady.

ANTIMONY—The market is strengthening in sympathy with higher values at the East.

SILVER—The market has held around 65 3/4 cts at New York, with certificates 1/2 to 3/4 cts higher than the metal. The strong bear influences heretofore reported are still paramount at the East and in Europe. To the persistent hammering of bears in silver certificates, the action of the two leading political parties and that of the New York Chamber of Commerce fortified by the gold-bug tendency of the Administration, is no doubt traceable the weak and unsatisfactory condition of the silver market to sellers. The State elections that are to be held, will have considerable bearing on silver. The advocates of free coinage claim over three-quarters of the members of the next house of Representatives and over one-half of the Senators. If Senator Sherman of Ohio should be retired from public life, no doubt it would be considered a free-coinage victory.

IRON—Imports the past week aggregate 300 tons of pig from Swansea. The market for both spot and near by arrivals, is in buyers' favor. The consumption is steadily enlarging. English advices report a fairly firm market. Eastern advices report buyers not disposed to go beyond this year's wants. The rail mills are being closely watched. When they enter the market as large buyers prices must appreciate.

COPPER—The market is easing off. It now looks as if the low prices looked for sometime ago, are to be realized soon. The stock abroad is slowly increasing. Iron Age reports the New York market as follows: "The market is somewhat unsettled at the present time. Reports to the effect that the Anaconda Co. will resume operations this month, seem to have slightly alarmed some sellers who were latterly strong on the 'bull' side, the downward movement in values in London is due partly to opening of Chili mines. In some quarters contracts covering several million pounds for delivery up to the first half of December were said to have been placed at 12.40c to 12.50c. There are faint indications that an interest representing a number of producers is not in harmony with jobbers or all consumers. Arizona ingot is in limited demand at the moment, but, with rather light supply on offer, prices are quite firmly held at 12c upward for prompt deliveries. In casting copper there has been very little movement and consumers hold aloof as much as possible pending the effect of the reported resumption of work at the Anaconda mines.

COAL—Imports the past week aggregate as follows: From Newcastle, N. S. W., 18,934 tons; Swansea, 3862; Glasgow, 2468; Hio, 1866; Sydney, 3368; Coos Bay, 600; Tacoma, 1900; Seattle, 3060; Nanaimo, 382; Liverpool, 2690; Departure Bay, 5190; total, 47,730 tons. Heavy arrivals the past week with several cargoes fully due cause spot coal to rule in buyers' favor. Colder weather the past few days has created a freer demand for house coals. Cheap coals is an assured fact for the coming winter.

COKE—Imports the past week aggregate 389 tons from Swansea. The market is essentially unchanged.

Eastern Metal Markets.

By Telegraph.

New York, October 15.—The following are the closing prices the past week:

	Silver	Silver in	Copper	Lead	Tin
Thursday	44 1/2	96 1/2	12 25	4 50	20 10
Friday	44 1/2	96 1/2	12 20	4 45	20 15
Saturday	44 1/2	97	12 20	4 45	20 15
Sunday	44 1/2	97	12 20	4 42 1/2	20 10
Monday	44 1/2	96 1/2	12 15	4 42 1/2	20 10
Tuesday	44 1/2	96 1/2	12 10	4 37 1/2	20 10

Quicksilver is firm at 60c. Borax is higher for carload parcels—concentrated, 84c, refined, 84c. Copper has been gradually sinking, as has lead. Pig tin holds its own.

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Brunswick Cons M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. Stadfield, Jr.	309 Montgomery St.
Buchanan M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	P. J. Sullivan.	121 Post St.
California & Arizona M. Co.	100,000, 1c, Oct 6, Nov 11, Dec 2.	T. E. Jewell.	310 Pine St.
Con New York M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	O. E. Elliott.	309 Montgomery St.
Cons St. Gothard M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	T. Wetzel.	320 Sansome St.
De Monte M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. W. Pew.	310 Pine St.
Garden Gravel M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	N. Thorne.	628 Montgomery St.
Gray Eagle M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	A. W. Barrows.	303 California St.
Inyo Marble Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	G. W. Luce.	137 Montgomery St.
Keystone Cons M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. H. Isham.	310 Pine St.
Kingman M. Co., Arizona.	100,000, 1c, Oct 6, Nov 11, Dec 2.	T. E. Johnson.	402 Montgomery St.
Locomotive M. Co., Arizona.	100,000, 1c, Oct 6, Nov 11, Dec 2.	H. F. Hill.	309 Montgomery St.
Mono G. M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	H. D. Walker.	309 Montgomery St.
New El Dorado M. Co., California.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. W. Pew.	310 Pine St.
North Belle Isle M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. W. Pew.	310 Pine St.
North Gould & Curry M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	C. H. Mason.	331 Montgomery St.
Ophir M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	E. B. Holmes.	309 Montgomery St.
Overman M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	E. D. Edwards.	414 California St.
Peerless M. Co., Arizona.	100,000, 1c, Oct 6, Nov 11, Dec 2.	A. Waterman.	309 Montgomery St.
Sierra Nevada M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	E. B. Holmes.	309 Montgomery St.
Siskiyou Cons. Gravel M. Co., Cal.	100,000, 1c, Oct 6, Nov 11, Dec 2.	F. Stone.	306 Pine St.
Silver King M. Co., Arizona.	100,000, 1c, Oct 6, Nov 11, Dec 2.	J. W. Pew.	310 Pine St.
Union Cons M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	A. W. Barrows.	303 California St.
Weldon M. Co., Arizona.	100,000, 1c, Oct 6, Nov 11, Dec 2.	A. Waterman.	309 Montgomery St.
Yellow Jacket M. Co., Nevada.	100,000, 1c, Oct 6, Nov 11, Dec 2.	W. H. Blauvelt.	Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Bushington M. Co.	A. W. Barrows.	338 Montgomery St.	Annual.	Oct 20
Cons Cal & Va.	W. Havens.	309 Montgomery St.	Annual.	Oct 19
Eureka Cons M. Co., Nevada.	H. P. Bush.	101 Sansome St.	Annual.	Oct 19
Happy Valley Hydraulic M. Co., Cal.	D. M. Kent.	330 Pine St.	Annual.	Oct 24
Mayflower Gravel M. Co., California.	D. M. Kent.	330 Pine St.	Annual.	Oct 19
Seal of Nevada M. Co.	W. Havens.	309 Montgomery St.	Annual.	Oct 21
Washington Blue Gravel M. Co., Cal.	H. Steingger.	Cor. Com'l & Lidesdorf.	Annual.	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Champion M. Co.	T. Wetzel.	330 Sansome St.	10	Aug 15
Cons Cal & Virginia M. Co., Nevada.	A. W. Havens.	309 Montgomery St.	50	Aug 17
Copits M. Co.	E. M. Hall.	314 Montgomery St.	30	Sept 10
Great Western Quicksilver M. Co.	A. Halsey.	328 Montgomery St.	30	Oct 1
Idaho M. Co.	W. Havens.	309 Montgomery St.	30	Oct 1
Mayflower Gravel M. Co., California.	D. M. Kent.	330 Pine St.	50	Aug 20
Pacific Coast Borax Co., California.	A. H. Clough.	330 Montgomery St.	100	Oct 10
Standard Cons M. Co., California.	J. W. Pew.	310 Pine St.	10	Oct 26

San Francisco Metal and Coal Market.

ANTIMONY.	THURSDAY, October 15, 1891.	STEEL.
Per lb.	14 @	English, 16 @ 20
BORAX.		Canton tool, 9 @ 9
Refined, in car lots	8 @	Silk Diamond tool, 9 @ 9
Unrefined, do.	8 @	Pick & Hammer, 8 @ 10
Concentrated, do.	4 @	Machinery, 4 @ 5
All grades jobbing at advance.		Toe Calk, 4 @ 5
COPPER.		TINPLATE.
Bolt, 22 @		B. V. steel grade
Sheeting, 22 @		14x20, spot, 3 75 @
Ingot, jobbing, 22 @		14x20, 14x20, 5 50 @
Do, wholesale, 22 @		Do, roofing, 14x20 5 50 @
Fine Box Sheets, 22 @		Do, do, 20x28, 13 00 @
IRON.		COAL.
Bar, base, 3 @		Pig iron, spot, 10 @ 21 1/2
Norway, base, 4 @		Irregular, 10 @ 21 1/2
Pig Iron.		
Eglington 27 @		Spot Lead, SPOT LEAD—PER TON.
Eglington 27 @		100 Wellington, \$9.00
Garnet 27 @		200 Greta, 8.00
Am. Soft, 23 @		300 Carbon Hill, 8.00
Oregon Pig, 25 @		300 Nanaimo, 8.00
Puget Sound, 27 @		300 Gilman, 7.00
Clay Lane White, 23 @		240 Seattle, 7.00
Shots, No. 1, 23 @		240 Wall, 7.00
Langdon, 25 @		200 Channel, 9.50
Thorncliffe, 26 @		200 Ch. hard, 14.00
Gardner, 26 @		200 Cumberland, 14.00
Barrow, 26 @		200 Do, bulk, 13.00
Garfield, 26 @		200 Do, bulk, 13.00
CHROME IRON ORE.		SCOTCH SPLIT.
Per ton, 10 @		Scotch Split, 8.00
LEAD.		WEST HARTLEY.
Pig, 4 1/2 @		West Hartley, 8.00
Bar, 4 1/2 @		Australian, 8.00
Sheet, 7 1/2 @		Liverpool steam, 7.00 @
Pipe, 6 1/2 @		Scotch Split, 7.00 @
SHOT.		CARDIFF.
Drop, 3 @		Cardiff, 25 @
Buck, 3 @		Cumberland, 10.00 @
Chilled, 2 @		Egg, hard, 10.00 @
By the sack, 1 @		West Hartley, 10.00 @
Flasks, old, 4 @		English, to load, 9.00 @
		Do, spot, in bulk, 10.00 @

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 21.	WEEK ENDING Oct. 1.	WEEK ENDING Oct. 8.	WEEK ENDING Oct. 15.
Alpha	60.75	60.75	60.75	60.75
Alta	55.65	55.45	55.40	55.40
Andes	1.05	1.25	1.10	1.15
Belcher	1.55	1.80	1.65	1.30
Belle Isle	50	50	50	50
Best Belcher	3.00	3.80	3.10	2.50
Bullion	1.55	2.01	1.80	1.40
Bodie Cons.	60	85	60	45
Bulwer	20	25	20	15
Commonwealth	1.20	1.30	1.10	1.00
Con. Va. & Cal.	5.87	7.37	5.05	3.50
Challenger	1.20	1.30	1.10	1.00
Chollar	1.60	1.80	1.50	1.20
Couderick	4.00	3.50	4.00	3.50
Coe	1.00	1.10	1.00	1.00
Caledonia	0.45	0.40	0.35	0.35
Crown Point	1.50	1.80	1.60	1.20
Crocker	40	40	40	40
De Monte	20	20	20	20
Eureka Cons.	20	2.50	2.00	1.00
Exchequer	53	70	60	45
Grand Prize	1.10	1.60	1.50	1.20
Gould & Curry	1.10	1.50	1.40	1.20
Hale & Norcross	1.50	1.80	1.60	1.20
Julia	20	15	20	15
Justice	50	65	55	50
Kentuck	25	30	25	20
Lady Wash.	20	20	20	20
Mono	30	35	30	25
Mexican	2.45	3.05	2.50	2.00
Navajo	15	20	15	10
North Belle Isle	15	20	15	10
Nor. Quest	20	20	20	20
Occidental	30	35	30	25
Ophir	3.85	5.00	4.05	3.25
Overman	1.20	1.60	1.40	1.10
Potosi	2.80	3.50	3.00	2.50
Peerless	10	10	10	10
Peer	10	10	10	10
Savage	2.45	3.10	2.80	2.30
S. B. M.	50	75	60	50
Sierra Hill	1.20	1.50	1.40	1.10
Silver Hill	15	20	15	10
Scorpion	30	35	30	25
Union Cons.	2.15	2.70	2.30	1.80
Utah	10	10	10	10
Yellow Jacket	1.15	1.45	1.20	1.00

* Assessment added.

Sales at San Francisco Stock Exchange.

THURSDAY, October 15, 9:30 A. M.	THURSDAY, October 15, 9:30 A. M.																
500 Alta	100 Iowa																
500 Bodie	100 Justice																
100 Belle Isle	100 Kentuck																
50 Best & Belcher	100 Mono																
100 Bulwer	250 Occidental	100 Caledonia	100 Ophir	100 Challenger	100 Potosi	100 Chollar	100 Peerless	800 Con Cal & Va.	100 Potomac	350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket
100 Caledonia	100 Ophir	100 Challenger	100 Potosi	100 Chollar	100 Peerless	800 Con Cal & Va.	100 Potomac	350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket		
100 Challenger	100 Potosi	100 Chollar	100 Peerless	800 Con Cal & Va.	100 Potomac	350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket				
100 Chollar	100 Peerless	800 Con Cal & Va.	100 Potomac	350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket						
800 Con Cal & Va.	100 Potomac	350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket								
350 Crown Point	200 Savage	100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket										
100 Hale & Norcross	350 Sierra Nevada	50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket												
50 Gould & Curry	150 Union Cons.	200 Hale & Norcross	350 Yellow Jacket														
200 Hale & Norcross	350 Yellow Jacket																

Write Proper Names Plainly.

People who only occasionally write for the press fail to recognize the importance of writing proper names plainly. They are familiar with a man's name and write it hurriedly just as they would ordinary words. But when this manuscript is received by persons not familiar with the names they are often printed incorrectly, and the correspondent thinks the printer is stupid for making the mistake. Editors and printers are more than anxious to have things correct, and take a great deal of trouble to make them so. But with a hilly written proper name, there is nothing they can do except make the best they can of it. It worries them more than it does the man whose name is improperly spelled. All this could be avoided if correspondents would put themselves in the printers place for a moment. Look at the name after it is written, and consider if a stranger would be sure to make it out. In lists of newly elected officers sent us, there are sometimes several names written so that they could be "translated" in two or three ways. A little ordinary care would save much trouble and annoyance. We hope that our correspondents will bear this in mind when they are writing, and then we shall be able to print the names of people as they should be printed, without any mistakes.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department to, San Francisco:

METROPOLITAN DISPENSARY Co., Oct. 10. Object, manufacture and sale of drugs. Capital stock, \$100,000. Directors—W. L. McFarland, C. P. Thompson, E. B. Lee, H. Donaboe and B. F. Carver.

GOLDEN CROWN M. Co., Oct. 12. Capital stock, \$100,000. Directors—George Montgomery, John W. Pearson, J. F. O'Gorman, S. E. Yount and M. L. Templeton.

LAND & INVESTMENT Co., Oct. 14. Capital stock, \$1,000,000. Directors—W. E. Dean, A. K. P. Harmon, D. C. Bates, J. O. Whitney and G. H. Maxwell.

AIR COMPRESSORS.—An average shipment of four air compressors per week is the record of the Clayton Air Compressor Works of No. 43 Day St., New York, during the past two years. In addition to air compressors for use in mining, tunneling, etc., numbers have been sold for aerating crude petroleum for fuel, elevating acids and working pneumatic riveters. The Clayton air compressors are so well known and their reputation so long and well established that any extended description of them is superfluous, and we would simply say that several new and important improvements have been made, prominent among which is the patent combined governor, which regulates the speed of the compressor and the pressure of air at the same time and without attention from the engineer in charge. Any one requiring compressed air for any purpose would do well to write the makers for catalogue and information.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send this paper to any one who does not wish it, but if it is continued through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
F. K. MERRITT—San Francisco.
J. T. ALSTON—Pikesburg, Cal.
Geo. W. BROWN—Sacramento, Cal.
J. H. CROSBY—Perry, Cal.
CHAUNCEY A. DAYTON—San Lucas, Cal.
O. R. GILL—Cambria, Cal.
W. T. HEALD—Cloverdale.
O. N. CADWELL—Carpenteria.

Assessment Notices.

CALIFORNIA AND ARIZONA MINING COMPANY. Location of principal place of business, 330 Pine Street, San Francisco, California. Location of works, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Directors held on the 23rd day of September, 1891, an assessment (No. 4) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, 330 Pine Street, San Francisco, California. Any stock on which this assessment shall remain unpaid on the 5th day of November, 1891, will be delinquent and will be advertised for sale at public auction, and no sale payment is made before, will be sold on MONDAY, the 30th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors.

T. E. JEWELL, Secretary.
Office, 330 Pine Street, San Francisco, California.

NEW-EL DORADO GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23rd day of October, 1891, an assessment (No. 4) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 5th day of November, 1891, will be delinquent and not advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 27th day of November, 1891, to pay

PROPOSALS FOR TUNNELS

OFFICE OF THE CHIEF ENGINEER OF THE Arrowhead Reservoir Company, San Bernardino, California, October 10, 1891.

SEALED PROPOSALS

Will be received by the undersigned until noon of TUESDAY, the 15th of December, 1891, for the construction of three tunnels—one of about 300 feet in length, the second about 400 feet in length, and the third about 500 feet in length, through rock, in accordance with plans and specifications on file in this office.

Proposals must be accompanied by a certified check in the sum of \$2000, to be returned to the unsuccessful bidders. The Company reserves the right to reject any and all proposals. A. H. KOEHLER, Chief Engineer The Arrowhead Reservoir Co.

HORACE D. RANLETT,
Ores, Mining, and Commission,
420 Montgomery St., S. F.

Ships under advances to smelting works in Boston New York, Baltimore and Liverpool.

Twenty-one years' experience in Shipping Ores and Managing Mines.

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All business conducted on Cash Basis.

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For information concerning this process for the reduction of Ores containing precious metals, and terms of license, apply to

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MINING AND SCIENTIFIC PRESS.

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MINES BOUGHT AND SOLD

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This Company also Manufactures a Malthine Compound for

RENDERING BOOTS AND SHOES WATERPROOF.

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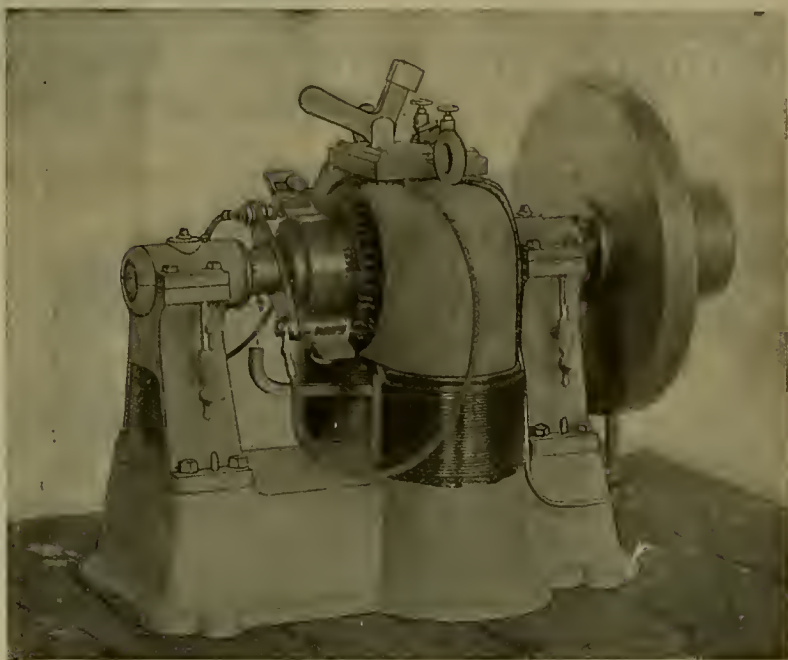
310 CALIFORNIA ST., S. F., Cal.

ELECTRICAL ENGINEERING CO.,

— MANUFACTURER OF —

Dynamos and Electric Motors

FOR THE TRANSMISSION AND DISTRIBUTION OF POWER



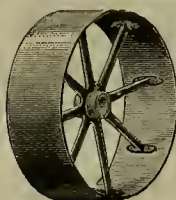
Manufacturer of and Contractor for the Installation of all Kinds of

ELECTRIC APPARATUS.

The Dynamos and Motors manufactured by this Company develop the highest mechanical efficiency; they require little or no attention, are almost noiseless, and run with an entire absence of sparks at the brushes, rendering the daily trimming of brushes unnecessary.

Electric Power Apparatus for Quartz Mills, Hoisting, Pumping, Drilling, and all Mining Work, where Long Distance Transmission is desired, a Specialty.

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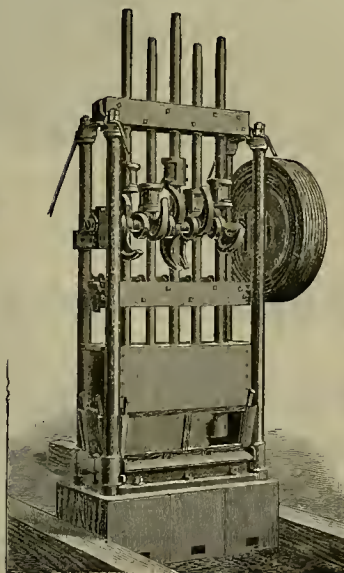
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J. R. LANE, Secretary. The red cord runs the entire length. Put up in boxes of 20 feet, or coils of 60 to 80 lbs. For sale by all dealers. W. T. Y. SCHENCK, Sole Manufacturer, 222 and 224 Market Street, San Francisco, Cal.

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WM. H. TAYLOR, President.

R. S. MOORE, Superintendent.

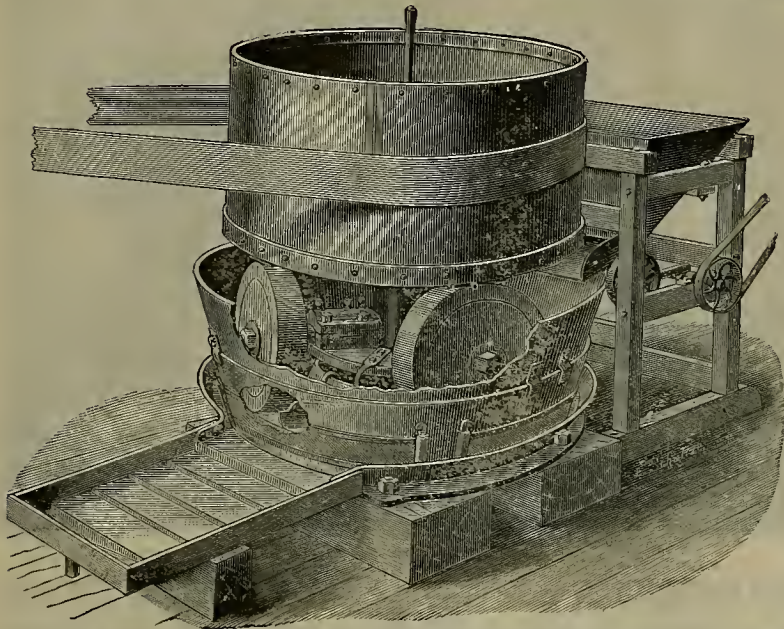
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- One (1) Amalgam Barrel.
- One (1) Batea.
- Three (3) Frue Concentrators.

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ROCK DRILLING, AIR COMPRESSING,
MINING AND QUARRYING

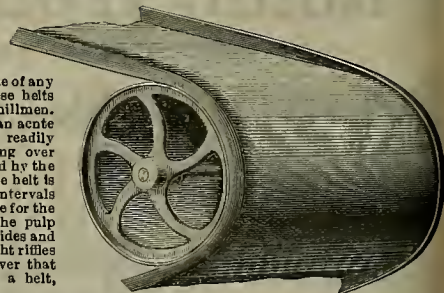
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THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight rifles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

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— MANUFACTURERS OF —

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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

THESE CASTINGS ARE EXTENSIVELY USED IN ALL THE MINING STATES and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

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GUARANTEED THE STRONGEST,
CHEAPEST, MOST DURABLE.
WRITE FOR PRICES.

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FRUE ORE CONCENTRATOR

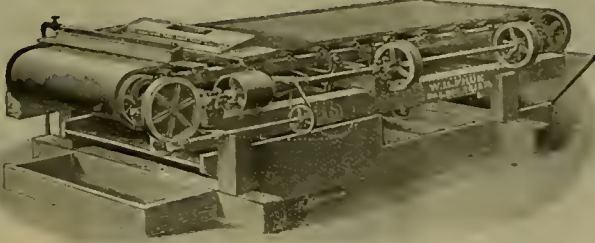
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880:
September 18, 1883; July 24, 1888;
and March 31, 1891.

Price of Plain Belt Frue Vanner, \$575, f. o. b.
Price of Improved Belt Frue Vanner, \$825, f. o. b.

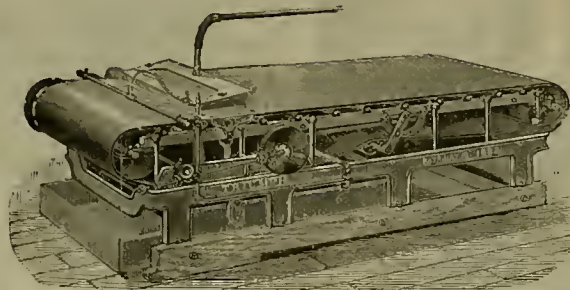
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Froes" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - \$550 f. o. b.

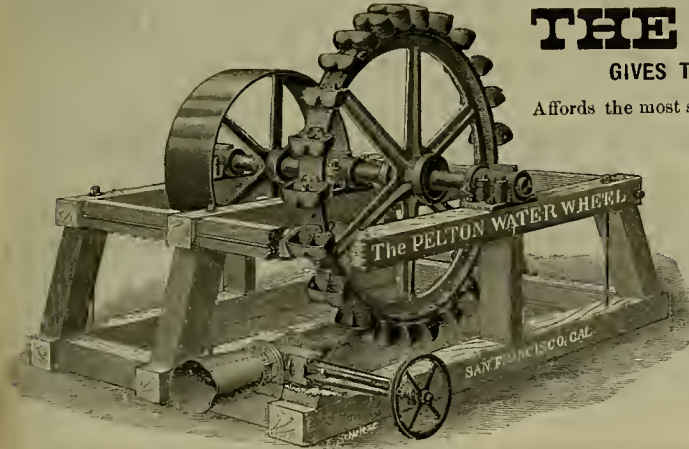
We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)
Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grase Valley, Nevada Co., Cal. }
GRASE VALLEY, NEVADA CO., CAL., Nov. 10, 1886.
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:
GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.
At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.
(Signed) Sup't North Star and Original Empire Mining Co. DAVID McKAY, JR.,
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.



THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 1300 IN USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

ELECTRIC TRANSMISSION.

The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

All applications should state amount and head of water, power required and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

THE PELTON WATER WHEEL CO.
121-123 MAIN STREET, SAN FRANCISCO, CAL., U. S. A.

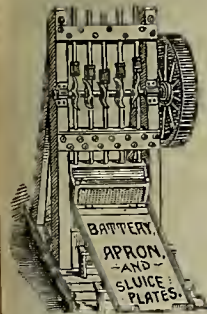
PELTON WATER MOTORS, Varying from the fraction of 1 up to 15 and 20-horse power, unequalled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. SEND FOR MOTOR CIRCULAR. Address as above.

THE GATES ORE AND ROCK BREAKER.

UNLIMITED IN CAPACITY. UNEQUALED IN EFFICIENCY. UPWARD OF 3,000 NOW IN USE. Will do more than twice the work of any other with the same cost in wear. Gives a fineness of product that increases the capacity of any mill from 25 to 40 per cent without any additional expense. THE BEST AND ONLY CRUSHER ADAPTED TO MACADAM ROAD WORK. Send for Circular.

It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

THE PELTON WATER WHEEL CO., 121-123 Main Street, San Francisco, General Western Agents.



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SILVER-PLATED AMALGAM PLATES for SAVING GOLD

In Quartz, Gravel and Placer Mining.

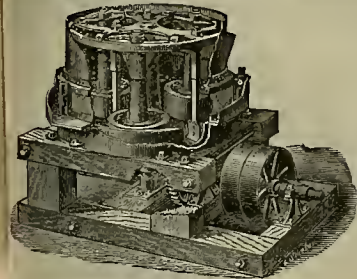
PRICES GREATLY REDUCED. ONLY REFINED SILVER AND BEST COPPER USED. OVER 3000 ORDERS FILLED. FIFTEEN MEDALS AWARDED. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated. These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Streets, San Francisco.

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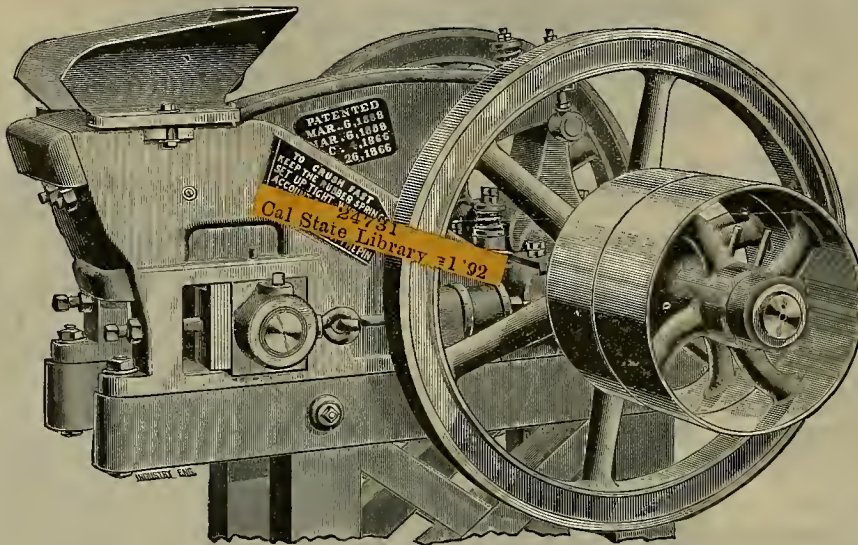
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INGERSOLL - SERGEANT
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AIR COMPRESSORS

— AND —
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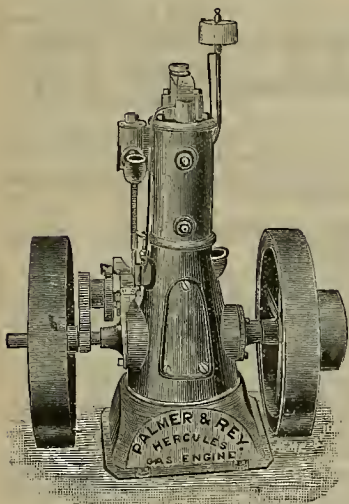
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The Lowest Priced Reliable Gas Engine on the Market.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE LIST.

For Simplicity it Beats the World. It has Fewer Parts, and is therefore Less Likely to get Out of Order than any other Gas Engine now built.

IT OILS ITSELF FROM A RESERVOIR. JUST LIGHT THE BURNER, TURN THE WHEEL, AND IT RUNS ALL DAY.

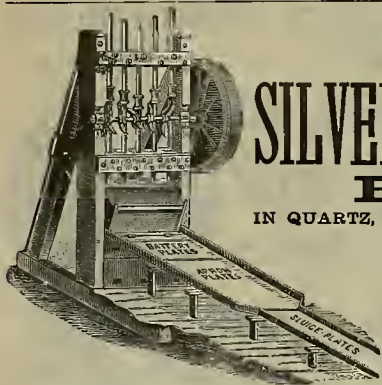
No Carburetor to get out of order. No Batteries or Electric Spark to care for. Always Ready, and a Boy can start it at once. No Double or False Explosions, which are frequent with the Unreliable Spark.

IT RUNS WITH A CHEAPER GRADE OF GASOLINE THAN ANY OTHER ENGINE, AND CONSEQUENTLY IT COSTS LESS TO RUN IT.

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IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER
AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

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Combined with Steam Shovel or Dredge.

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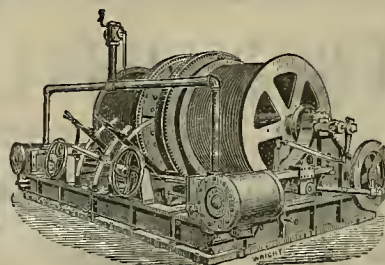
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1, 2, or 4 Drums, with Reversible Link Motion or Pat. Improved Friction.

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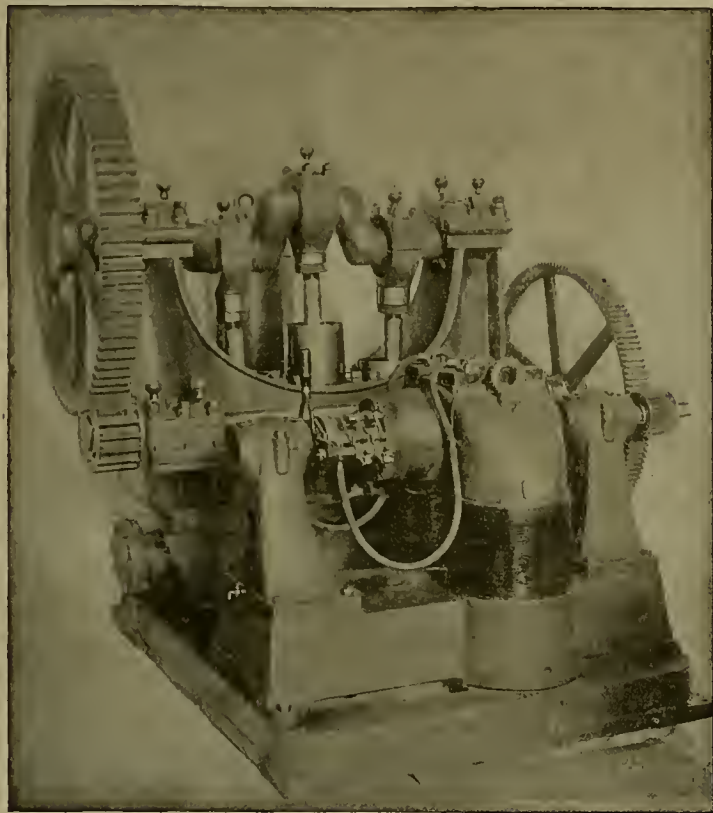
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 17.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 24, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.



GOULD'S TRIPLEX ELECTRIC PUMP.

The Triplex Electric Pump.

The triplex or three-cylinder pump, made by the Gould Manufacturing Co., possesses important advantages in combination with the Thomson-Houston electric motor. The pump offers absolutely even and unvarying resistance to the motor under all conditions, and consumes but a minimum of friction in parts. Careful tests of the outfit complete, have shown a high efficiency. The three-throw crank shaft, in the stroke of which there is no dead center, prevents jerky motion and vibrations. The pump and motor are mounted on one bed-plate, and are practically one machine, being thoroughly tested as such before going into active service.

In villages or cities, where power can be had from electric light or power circuits, electric pumping offers relief from the discomforts of insufficient or hard and unfit water supply, and the hardly lesser trials of disagreeable, noisy and dangerous pumping engines in vogue.

The Triplex Electric Pump will take water from any source, as spring, cistern or well and force to upper supply tanks of residences, shops, warehouses, buildings, etc., or force city water to a higher point than its own pressure will carry it, as is often the case in the more elevated city districts or very tall buildings.

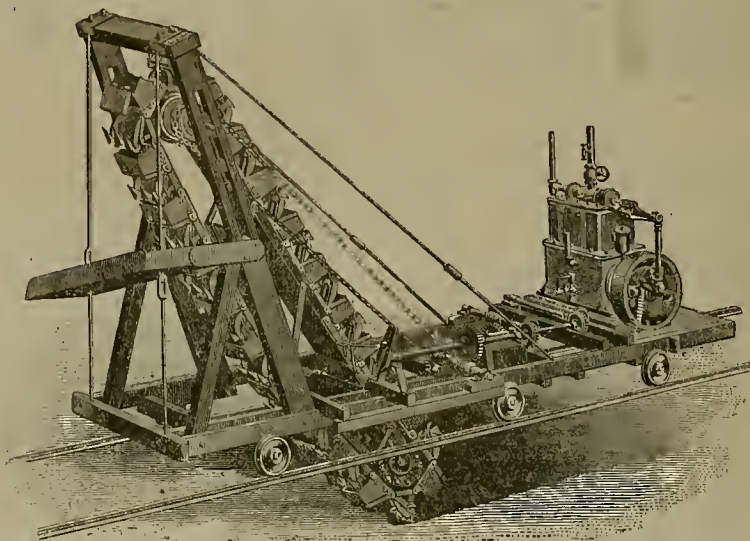
In such factories as large cotton mills, woolen mills, steel works, etc., and in fact, in any large establishment where work is distributed over a large territory, the employment of electrical transmission of energy for pumping can be used to great advantage.

The steam pump is in common use. Steam is generated in the boiler and transmitted

through long lines of pipe to pumps, where the work of pumping is performed. It has been found by actual experiment and demonstrated time and time again that these direct acting steam pumps are wasteful consumers of steam.

With electrical pumping outfits all this is changed.

One of the most troublesome questions in mining operations is the disposal of water. By the introduction of electricity for underground work the problem is greatly simplified. The necessity for long lines of steam pipe is removed, and in the place of hot steam pipes spreading dry rot in the vicinity, a small copper wire is suspended from wall or ceiling; or, the current may be taken from the trolley wire if the mine is equipped with an electric haulage plant. In

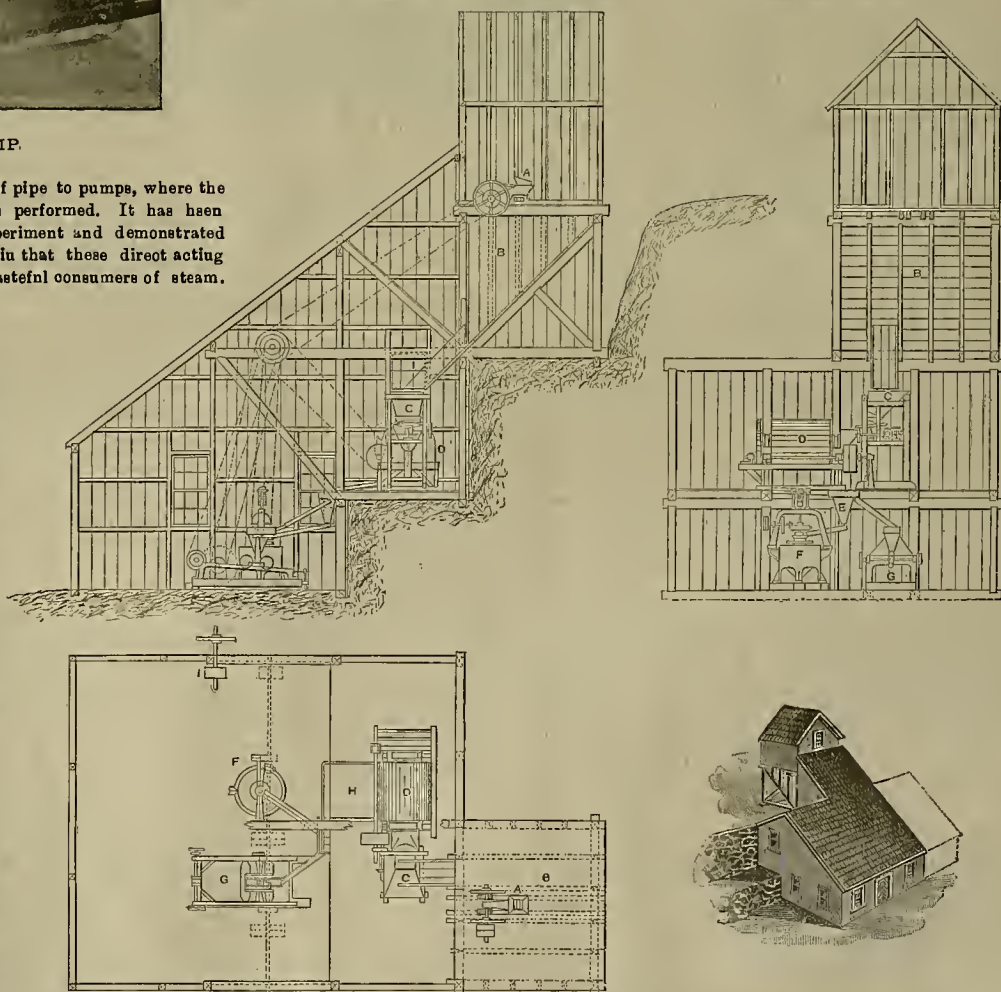


TUCK'S EXCAVATOR AND LEVEE-BUILDING MACHINE.—See page 269.

some cases, where transmission from the surface by steam or compressed air was utterly impracticable, and an underground steam plant seemed necessary, it has been found that the cost of excavating and drilling holes for the

chimneys would exceed the total cost of the electric pumping plant.

The accompanying illustration shows a Gould pump and Thomson-Houston motor, (Continued on page 269.)



THE "DODGE" PULVERIZING, AMALGAMATING AND CONCENTRATING MACHINE.—See page 269.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Two Sides to the Question.

EDITORS PRESS:—Having formerly traveled in the mountains and lately visited the valley in the interest of Board of Trade, we find the debris question an absorbing topic in both sections. A friend, once miner, now farmer, proposed a solution worth notice and [apparently] fair. Those who have seen a great industry dormant in the mountains and in the valleys more than 50,000 acres rendered hopelessly sterile on the Yuba, Bear and American rivers, the navigation of the Sacramento imperiled and the harbor of San Francisco steadily shoaling, need not be told of its importance. The most ardent anti-debris champions say they would be glad to see every mine working full blast that can be worked without damage to others. Miners say they have bought property of the Government and are entitled to its protection. We believe that Government is bound to protect navigation and that it is a principle of law as old as the law itself that no man has a right to use his property to his neighbor's injury. We see nothing to prevent the bulk of the debris now in the streams from being carried down the Sacramento to the bay. As the river shoals, we see nothing to prevent an increasing tendency to seek new channels.

The Solution.

As rivers are national highways, and mineral lands were patented by Government, he claims that the United States should take control of the matter. Let a commission be appointed whose duty shall be to make expert survey of each mine. If it can be worked without injury to others, let them issue license prescribing the conditions under which it shall be operated. In case the mine cannot be worked, it should be appraised on a reasonable valuation, condemned, paid for and dismantled. The plant should be sold at public auction and site become Government property not eligible to future mineral location. In appraisal the commission should not award what it is hoped the mine may produce, but should be on a basis similar to former assessments for taxation.

Instead of awaking sectional hostility, as by present arrangement, he would have business carried on by strict U. S. regulations.

Sacramento and San Francisco are as vitally interested in this matter as Marysville. All these cities are almost equally interested in anything that will promote the prosperity of the mountains where their trade so largely centered in the palmy days of "And Lang Syne."

FRANK S. CHAPIN.

A New Concentrator.

Mr. George Johnson of San Francisco, a brother of Peter Johnson, Esq., of this city, has recently invented a new concentrator that promises to have a large sale in the market, as it will cost less and be much easier to take care of than any other machine. It is now on exhibition at the shop of the Union Machine Works, 130 Main street, San Francisco.

The machine is the lightest in the market, having less iron work than any other. Its length is 11 feet and its width 4 feet. The belts are made of prepared canvas, and are 26 feet in length by 4 feet in width. These belts will cost only about \$10, and will last from one to two years, being chemically prepared.

The machine has a side motion, running from 105 to 115 shakes per minute, with a throw or side movement of 2 3/16 inches. The dip of the table is three-fourths of an inch. The sides of the belt are not flanged as in case of the rubber belts, but are raised by means of a cone-shaped end on each roller. The belt is revolved by a screw gear which is quite simple. Between the stationary and movable portion of this gear, there is a piece of wire rope 22 inches in length which admits of a great deal of movement.

The table is suspended from non-parallel supports, and the belt is tightened by means of a sliding bearing with screw attachments. The side motion of the machine is produced by arms fastened to the frame. These arms are set in bearings which are capable of being extended or contracted, as may be desired, thus changing the throw of the machine.

Although not yet practically tested, it has been pronounced by those who have examined it to be a success. It is simple in construction, having no complicated parts, and will cost less than any concentrator yet put on the market. The cost will be about \$450, complete.

Mr. Johnston has written to the W. Y. O. D. Mining Company of this place, asking them to have a trial of the machine made in their mill, but as yet has received no answer. Each machine will answer for a battery of five stamps.—*Grass Valley Telegraph*.

LARGE BLOCK OF ASPHALTUM.—A four-horse team arrived at Santa Barbara on the 15th with a large block of pure asphaltum from the mine of the Santa Barbara Asphalt Company at La Patera, 12 miles west, to be sent to the Chamber of Commerce exhibit at Los Angeles. It was just as it was taken from the mine and weighs 2 1/2 tons. It is believed to be the largest piece of asphaltum ever mined in one block. The mine was opened about a year ago.

Sapphires and Rubies in Montana.

A London cablegram, published last week, told of the organization by the Marquis of Bristol, Earl of Mowbray, Sir Francis Knollys, the Prince of Wales' Secretary, the Earl of Desai and a dozen other titled Englishmen, of a gigantic syndicate to work rich sapphire and ruby grounds, 12 miles from Helena, Montana, on the Missouri river.

United States Senator W. F. Sanders of Montana, who is now in San Francisco, lives at Helena and tells much that adds significance to the discovery.

"It is true," he said, "that the English gentlemen have taken hold of the property. It was first brought to their attention through E. V. Smally, but the ground was largely worked over first for gold. The diggings lie on both sides of the Mission and comprise several old placer bars once known as Eldorado Bar. As far back as 20 years ago sapphires and rubies were found here. Several diamonds have also been found, and they were very good ones, too."

"The sapphires are of all sizes and colors. Some of them are of a pale blue; others are nitramarine, and still others are remarkably clear and white, and at night sparkle and twinkle with great brilliancy. In the Helena market they command from \$20 to \$200 each. I was shown recently by a jeweler there a tray of over 100 sapphires and rubies, gathered at random, that were very fine."

"The rubies are of all shades and make very handsome settings. There seems to be a great abundance of both, and I would not be surprised if many good diamonds would be discovered there. I was down on the grounds three weeks ago to-day. On one side of the river were eight men at work. I saw no new machine of the kind mentioned, but the miners were working as they would to find gold, the stones by their weight settling to the bottom of the rockers."

"I was shown about a quart of the stones that they had got out, and they were very pretty. I do not think the ground on the other side of the river, where the syndicate also owns property, was being worked then. I understand the men in the company have the control of the market on precious stones."

The property of the Montana Sapphire and Ruby Co. is located along the Missouri river, nearly north of Helena, distant about 16 miles, and comprises between 3000 and 4000 acres. The lands are the property of F. D. Spratt, who secured them by location and purchase. A gentleman named Streeter recently visited the properties, coming directly from the diamond fields of South Africa. In his report to the London parties interested, he said the fields were the greatest discovery since those made in Africa. The property cost Mr. Spratt about \$50,000. Since it became known that they were very valuable, but little information has been given out concerning them and only the parties interested know the extent of the fields or have any idea of their actual value. Considerable trouble has been experienced with claim jumpers, and the title to some of the ground is in dispute at present. To work the property it will be necessary to erect a powerful pumping plant to raise water from the Missouri river for sluicing purposes. Negotiations for the sale of the property to English capitalists have been in progress some time.

George Frederik Kunz, an expert with Tiffany & Co., author of a standard work on "Gem and Precious Stones," and Special Agent of the Census Bureau in the Department of Precious Stones, who made a personal inspection of the territory, spoke as follows to a reporter in New York regarding the Montana property:

"The only territory in this country which has been at all prolific of sapphires is the placer ground, six or seven inches in depth, between Ruby and El Dorado bars on the Missouri river, 16 miles east of Helena, Montana. Here sapphires are found in glacial, auriferous gravels, while sluicing for gold, and until now have been considered only a by-product. Up to the present time they have never been systematically mined. In 1889 one company took an option on 4000 acres of the river banks, and several smaller companies have since been formed, with a view of mining for these gems alone, or in connection with gold. The colors of the gems obtained, though beautiful and interesting, are not the standard blue or red shades, generally demanded by the public."

Mr. Kunz says that stones not of the standard colors are called fancy colored. Fine stones are worth from \$50 to \$100 per carat, but he said he could place no price on the fancy colored, which are much cheaper.

"Tiffany & Co.," he continued, "have not sold, nor did they send a true red ruby, or a true blue sapphire from Montana, but they have seen interesting fancy colors, the sale of which is very limited compared with the standard."

Mr. Kunz declined to estimate the value of the Montana bore. They are not being worked to any extent now, and there seemed to be little enthusiasm among the people of Helena about them.

IMPORTANT MINING SUIT.—A mining lawsuit which will attract widespread attention in the mining world came to trial at Butte, Montana, on the 15th. It is the case of R. C. Chambers et al., virtually the Anaconda Company, against P. A. Largey et al., for trespassing and damage in the sum of \$600,000. The

plaintiffs own the Bell mine, and the defendants, backed by a Colorado company, of which Henry Wolcott of Denver and Hon. W. A. Clark are members, own the Speculator mine. It is alleged the defendants have extracted ore from the Bell vein, which has its apex on the surface of the Bell ground, but dips north under the side lines of the Speculator ground and passes below the surface line of the Speculator lode. The main point involved is the question whether the Bell people have a right to follow their vein outside of the surface lines. The Speculator people claim that they have not—that the lines should be drawn downward perpendicularly. The Speculator people also contend that the Bell vein is only a spar of their ledge. Leading attorneys of the State and J. F. Vaile, of Denver, are employed in the case.

The Elevators of New York.

"The elevators in the sky-scraping office buildings, hotels and apartment houses in this city carry more passengers each day in the week, excepting Sunday, than do all the elevated railroads and street-car lines combined, and while the facilities of the latter are frequently taxed to their utmost, the capacity of the elevators for shooting people skyward is practically unlimited."

So spoke an expert in this branch of industry to a *Mail and Express* man the other day. At first sight his statement appears a little incredible, but any one familiar with the subject will readily believe it. Many of the larger buildings have as many as nine elevators each, and during the business hours of the day are run to their full capacity. They carry from 10 to 30 passengers on each trip, and few of them take more than two minutes to accomplish the round trip, many of them considerably less.

The Equitable building has nine high-speed elevators in daily use. A *Mail and Express* man asked the man in charge how many people availed themselves of this modern convenience in the course of the day.

"Oh, about 50,000," he replied, airily, "and that don't include beggars, peddlers and those who walk. Don't believe it, eh? Well, just try and count them."

The reporter did try to count them, but he might just as well have tried to count the hairs in the head of a Ciroasian beauty. Finally he devoted his energies to two cars, and found that the average round trip occupied a little over a minute and a half and the number of passengers carried on each trip was 30.

But the Equitable affords only a single illustration of what is done in a score or more office buildings down town. The Mills building has half a dozen elevators, which carry from 20,000 to 25,000 people daily. The great double building of the Manhattan company on Wall street has an unequalled system of elevators that carry nearly as many more, while the elevators in the Potter building, the Produce and Cotton Exchanges, and the Washington building relieve probably about 100,000 people more every day from the necessity of trudging wearily to the species among the clouds.

The speed of elevators varies considerably, and few if any are even now at their maximum.

There are several reasons for this. In the first place there is no necessity for it, and in the second the sensation produced on many people by a rapidly moving elevator is extremely unpleasant, closely resembling that caused by the rolling of a ship at sea. The speed varies from 100 feet a minute in the old-fashioned type of elevators to 2000 feet a minute in the improved pattern. The latter, however, are seldom run at a greater speed than 300 or 400 feet a minute.

Many modern residences on Fifth avenue and other fashionable thoroughfares are fitted up with elevators that are so simple of construction that almost any member of the family, or the servants can operate them. When it is remembered that many of these mansions are often six and seven stories high, the need of some easy method of "going up-stairs" becomes apparent. Many of these elevators in private dwellings are fitted up in the highest style of the upholsterer's art in order to be in harmony with their surroundings, and form a striking contrast to the old-fashioned, creaking, noisy "lift" of other days.—*Mail and Express*.

BANK GROWTH IN THE STATE.—Thos. Brown, cashier of the Bank of California and President of the California Bankers' Association, presented some interesting facts in his opening address to the convention yesterday. He said: "The growth of banking in the State in the last decade has been remarkable. On the 1st of July, 1888, the whole number of State incorporated banks in the State was 78, while on the 1st of July, 1891, the number was 149, showing an increase of over 140 per cent. Some of this was due to the incorporation of private banks, but most of the increase is due to new organizations, many of which have come into existence in places where previously there were no institutions of this kind. Eleven years ago, the 78 State incorporated banks reported a paid-up capital of \$25,127,140 and \$79,278,287 due depositors, their aggregate resources being \$119,575,520. At the beginning of the last fiscal year, the 189 State incorporated banks reported a paid-up capital of \$49,670,414 and \$105,776,311 due depositors, the aggregate resources footing up \$244,547,141."

Liability of Stockholders.

A recent decision handed down by the Supreme Court will be of especial interest to corporations in this State, as it enunciates a new principle in regard to the liabilities of stockholders. The case was that of *Baines vs. E. S. Bahcock, H. L. Story and Josephus Collett*, the defendants being sued as stockholders of the San Diego Street Car Co. It is generally known that stockholders in this State are subject to a "statutory liability"—that is, for a proportionate amount of indebtedness contracted while they are stockholders. But this late decision goes far beyond this, and holds that still another liability exists, so long as the stock remains unpaid in full. The decision, in brief, is that a creditor of a corporation, who has obtained judgment and had execution returned unsatisfied, may maintain an action against the stockholders for the benefit of himself and all other creditors who may come in, to recover the amount remaining unpaid on the stock, and have the amount applied in satisfaction of the judgment. To do this no assessment or action by the corporation is necessary. It is only essential to show a judgment against the corporation, return of execution unsatisfied, and that the defendant is holder of shares not fully paid, to entitle the creditor to a judgment for the amount due on the shares.

In such case, the judgment and execution are conclusive and cannot be disputed by the stockholder, and it is no defense to show that the stock was held only as agent or trustee, or for convenience. The only test is: Does the stock stand on the books of the corporation in the name of the defendant?

It is also decided that in this equitable action the creditor may sue any one or more of the stockholders, from which it results that a creditor may recover the entire amount of his debt from any one solvent stockholder, if he owes so much on his stock.

It will be seen that this decision is of vast importance, especially in this region, which is flooded with corporations, very few of which have capital stock paid up in full. The opinion was written by Justice de Haven and concurred in by the other judges. The judgment against the above defendants was for \$40,000.—*San Diego Exchange*.

The Technical Society.

The Technical Society of the Pacific Coast has issued a circular letter to the public, and particularly to the business world, in which they draw attention to the important part the technical professions play in the matter of industrial economy and the scope of the subjects that have come under the consideration of the society in the professional papers published by them.

The society was established in 1884, and since that time 74 exhaustive papers, dealing with almost every scientific subject and profusely illustrated, have been read before the members by the authors and then printed.

The object of the Technical Society is the professional improvement of its members, the encouragement of social intercourse among men of practical science, the advancement of the technical professions and the establishment of a central point of reference and union for members. In spite of many difficulties which have arisen from time to time since its establishment it has proved itself of great benefit to the engineering profession.

The feature of the institution in which the general public are mostly interested is its associate membership, which admits men who, by reason of education or business, are brought in contact with, are interested or in sympathy with the technical professions. In order to encourage this branch of membership a reduced rate of annual dues has been adopted.

The other grades of membership are what are known as members and juniors, and embrace civil, mechanical, mining and electrical engineers, architects, surveyors, chemists, naval architects and technologists.

Another advantage to the engineer is the exchange list, which includes about 200 publications of engineering and scientific societies in the United States and Europe. This feature is invaluable to resident members who are desirous of looking up information, while those at a distance who desire copies of the papers that have been read before the society can receive them through the mail.

THE FORMATION OF PROJECTILES by the electric welding process is proving to be of great value. The shells from modern rapid-fire guns have to be furnished with an intensely hard point for armor-piercing purposes, and except up to a recent date none except the smallest sizes have been successfully made. It looks now, however, as if the electric welding process would come into play with excellent effect, for it is now possible cheaply and rapidly to furnish the steel body of the shell with a chrome steel point that is all that can be desired.

DEFINITION OF THE SCIENCES.—At the jubilee meeting of the chemical society of London, Lord Salisbury offered the following definitions: Astronomy is largely composed of the science of things as they are; geology consists mainly of the science of things that probably were a long time ago, and chemistry is the science of things as they actually are at the present time. An electrical journal adds that electricity represents the science of things as they probably will be.

Popular Names For California Trees.—Continued.*

[Written for the Press by J. G. LEMMON.]

No. 2.—Tribe Abietineae of the Conebearers. Concluded.

The important tribe of Pitch Trees, or *Abietineae*, is very large and valuable. One of its most important families—the Pines—has been treated in a former number. Following are the remaining genera, the popular or English name which it is desired to establish, being given first, followed by the botanical name by genus and species, together with a brief description—for certainty of identification.

SERIES I. FASCICULARES.—Trees with the principal leaves mostly in fascicles or bundles of two to 60 leaves, each.

The Pines with leaves in fascicles of mostly two to five and sheathed at base and with cones diverse comprise the first genus or family and have been discussed.

The other two (or three) genera—True Cedar, Larb and False Larch (?)—have their leaves in fascicles of few to 60 tufted on the ends of short branchlets.

TRUE CEDAR.—*Cedrus*, Link. Trees with cones erect, large, depressed at the ends; the leaves persistent several years.

CEDAR OF LEBANON.—*Cedrus Libani*, Barreller. Leaves dense, green; branches flat, fan-shaped, on long drooping limbs. (Cultivated in Cal.)

TREE OF GOD, INDIAN CEDAR.—*Cedrus Deodara*, London. Leaves glaucous or whitish in

ALPINE WESTERN SPRUCE.—*Hesperopence*, Lemmon. Cones terminal, small, the scales usually reflexed at maturity; leaves scattered, (not in two ranks,) narrowed at base and with a single, large resin dot; seeds angular, and bearing resin vesicles; pollen bilobed.

PATTON'S ALPINE WESTERN OR SPRUCE.—*Hesperopence Pattoniana*, Lemmon. Alpine or sub-alpine trees of the Sierra and Rocky mountains. A solitary species usually classed with the Hemlock Spruces, but leaves not "in two ranks," etc.

HEMLOCK SPRUCE.—*Tsuga*, Carriere. Cones terminal, very small; leaves two-ranked, flat, not with prominent pulvina, etc., only one species in Northwest America; pollen discoidal.

WESTERN HEMLOCK SPRUCE.—*Tsuga Mertensiana*, Carriere. A large tree of the Northwest, reaching Northern California.

False Spruce.—*Pseudotsuga*, Carriere. Cones sub-terminal, with long, exserted bracts; or leaves between the scales; leaves petioled or stalked, leaving when fallen, oval, transverse near base, etc., Two species, both in Northwest America.

DOUGLAS SPRUCE.—*Pseudotsuga, taxifolia*, Britton. A large and valuable lumber tree of the Northwest; abundant in California.

BIG CONE SPRUCE.—*Pseudotsuga macrocarpa*, Lemmon. A very large-coned spruce, local on the San Bernardino and neighboring mountains of California. Trees less symmetrical than the other species.

SEO. 2.—ERECTUS.—True Fir, Cones erect, lateral, sessile, nearly cylindrical axillary from the upper side of mostly the upper limbs; the scales deciduous. Only one large genus

with the large midrib long exserted. Leaves very large and long.

A Southern California Apiary.

The engraving on this page shows the famous Sespe apiary. It is located in Ventura county, on the bank of the Sespe river, from which it takes its name. In 1876 R. Wilkin, of Caddis, Ohio, became tired of trying to winter his bees in that cold climate, and moved his large apiary to California, locating it on this spot. The ground has been occupied by bees ever since, but the hives have been changed and it is now owned by his son-in-law, J. F. McIntyre.

The grape vines in the foreground were planted soon after the apiary was located, and produced a heavy crop of grapes every year, with little injury, it is claimed, from the bees. The land slopes about ten feet from the back of the apiary to the honey house, which makes it easy to wheel the honey into the house. Two carts, shown in the foreground, are used to wheel in the honey. Each cart carries four "supers" full, or about 200 pounds at a load. When extracting, one man fills one cart with honey in the apiary, while the other extracts the other cart-load in the honey house. It takes from 20 to 30 minutes to fill a cart, and the man in the honey house can easily extract one in the same time. A three-inch pipe runs from a reservoir down through the apiary and connects with a Pelton water motor in the honey house, which furnishes sufficient power to run a small circular saw or

A High Dam.

An Immense Storage Reservoir.

It is with considerable satisfaction (says the San Jacinto Register of San Diego Co., Cal.) that we are enabled to day to give to the public the able report of Consulting Engineer J. D. Schuyler to the Hemet Water Co., relating to the company's reservoir. Coming as it does from Mr. Schuyler, who is known to have no superior in his profession on this coast, it means more than our readers can imagine to the San Jacinto valley.

It is double the capacity of the great Sweetwater, and equal to the celebrated Bear Valley reservoir. This we have from Mr. Schuyler himself, and he is in a position to know, having built the former, and is familiar with the workings of the latter.

Our readers will also be interested to know that we have here the highest dam in the known world. The following is the report:

Report on Lake Hemet Reservoir and Dam.

SAN JACINTO, Oct. 5, 1891.

President and Directors Lake Hemet Water Co.,—GENTLEMEN: The total capacity of the reservoir to be formed by the dam now being constructed by the company you represent has been a matter of vague conjecture until recently, when the minute and detailed surveys were completed by Mr. C. S. Alverson, from which I have personally made the following computations:

Height Above base of dam.	Area flooded in acres.	Storage capacity in gallons.	Capacity in millions of gallons for 6 months.
30 ft.	1.03	2,070,750	0.35
40 ft.	1.82	10,838,250	4.62
50 ft.	2.71	36,960,250	15.50
60 ft.	3.62	103,266,500	44.20
70 ft.	4.54	251,879,250	107.50
80 ft.	5.50	522,412,750	223.20
90 ft.	6.55	908,005,250	388.80
100 ft.	7.62	1,430,702,750	614.00
110 ft.	8.75	2,149,985,250	920.00
120 ft.	9.92	3,099,285,000	1,325.00
130 ft.	11.15	4,427,777,500	1,895.00
140 ft.	12.42	6,216,002,500	2,690.00
150 ft.	13.75	8,415,217,750	3,600.00

†The lowest foundations are 13 feet below base of dam proper.

The survey did not extend to higher levels than 150 feet, but judging from the rapid rate of increase above the 130 feet level and from the general "lay of the ground," I estimate that the capacity of the lake at the 160 foot level would be fully 11,500,000,000 gallons—or nearly twice the capacity of the Sweetwater dam. This would afford a constant flow of 4900 miners' inches for 180 days.

The present intention of the company is to construct the dam to the height of 150 feet, although I have laid the foundations sufficiently broad to enable you to carry the structure ten feet higher if desired. The class of masonry of which the dam is being built is certainly the finest I ever saw, and I doubt if it has any superior in America in works of that character. Blocks of granite weighing five to ten tons are set closely together in beds of Portland cement concrete, thoroughly rammed into all joints. When completed, it will unquestionably be not only the highest, but the finest dam on the continent, strong, safe, solid and secure for all ages to come. From my observations of the flow of the stream, I have no hesitation in saying that in my opinion the water supply from winter storms is sufficient to fill the reservoir to the height of 160 feet every year.

In addition to the flood waters of winter, the summer showers of July and August furnish no inconsiderable volume. My observation of several of these showers, which were of almost daily occurrence for several weeks, was that for an hour or two the stream would flow at a rate of 250,000,000 to 300,000,000 gallons daily, dir-minishing to the normal low water flow of about 3,000,000 gallons daily, in 15 to 20 hours. I think the reservoir would receive an addition of 50,000,000 to 150,000,000 gallons from each of these showers, and sometimes considerably more.

This source of summer supply, which is a resource peculiar to the Southern California mountain region, is likely to afford an effective increase in the duty of the reservoir of 10 to 15 per cent. The constant flow of the stream in summer is more than sufficient to offset the loss by evaporation on the surface of the lake.

As the area of dry lands in the valley requiring water is greater than any possible supply available, it seems to be a profitable and safe proposition to carry the dam to its utmost limit of height. It is possible to go still higher than 160 feet, but not advisable, on account of the necessity of building a considerable length of auxiliary dam in the gap in the ridge south of the main dam, the lowest point in which is 123 feet above base.

The masonry has now reached a height of 33 feet above base, or about 46 feet above the lowest bottom. The organization is fully effected and working smoothly, the plant is complete and operating successfully as planned, and with reasonably good luck the structure can be completed to the 150 feet level in a year from this time.

The thickness of the dam at the extreme bottom is about 100 feet, which is greater than its length, or the width between canyon walls at the height of 50 feet, dimensions which have no parallel for stability among dams in the known world. Yours faithfully,

JAS. D. SCHUYLER,
Consulting Engineer.



THE SESPE APIARY IN VENTURA COUNTY.

larger fascicles on fewer, more irregular branches. (Cultivated.)

LARCH OR TAMARACK.—*Larix*, Link. Trees with cones pendent on branches of the previous season's growth; leaves promptly deciduous.

LYALL'S OR WOOLY LARCH.—*Larix Lyalli*, Parlatore. Small trees of the Cascades and eastward to the Rocky Mts., the branchlets and cones clothed with whitish leaves, the cones promptly deciduous.

GREAT WESTERN LARCH.—*Larix occidentalis*, Nutt. Large, usually tall trees of the Northwest, on high or dry situations, peculiar for their thick bark and the cones bristly with long-exserted bracts.

SERIES II. SOLITARES.—Trees with all the leaves solitary, not tufted.

SEO. 1. PENDERES.—The Spruces. Trees with fruit pendent from or near the end of the branchlets. Four closely related genera, often considered as one polymorphous genus.

TRUE SPRUCE.—*Picea*, Link. Cones terminal, leaves scattered, sessile, with prominent, persistent bases or pulvinae.

WHITE SPRUCE.—*Picea laza*, Sargent. Trees of far northern regions, with glaucous or white leaves.

BLACK SPRUCE.—*Picea Mariana*, Sargent. Northern trees with dark green foliage.

ENGELMANN'S SPRUCE.—*Picea Engelmanni*, Engelmann. Rocky Mts. and westward to near California. Branchlets short and thick, cones elliptical.

PRICKLY OR BLUE SPRUCE.—*Picea pungens*, Engelmann. Rocky Mts. and westward to Wyoming, along streams. Remarkable for its sharp, very glaucous foliage.

GREAT TIDE-LAND SPRUCE.—*Picea Sitchensis*, Carriere. Reaches the California coast from the north. Large trees, with slender branchlets and cylindrical cones.

BREWER'S OR WEeping SPRUCE.—*Picea Breweriana*, S. Watson. A recent discovery on the Siskiyou Mts. Branchlets very long, slender and pendent, cones tapering to each end.

*The first article in this series was published in the RURAL of May 23, 1891.

well represented in the Northwest, including California.

TRUE FIR.—*Abies*, Link. Mostly large trees with branches in horizontal whorls or strata; the leaves two-ranked on young trees and lower branches. The Firs of Northwest America are comprised in two sections:

SEO. 1.—*Megacarpa*, Red Fir.—Species with cones large; bark red within; leaves short, mostly quadrangular.

AMABILIS, OR LOVELY RED FIR.—*Abies Amabilis*, Forbes. A rare tree on peaks south of the cascades of the Columbia and northward to Fraser river, cone bracts short, concealed.

NOBLE, OR BRACED RED FIR.—*Abies Nobilis*, Lindley. A rare tree near Mt. Hood, and in a few other northern localities. Cone bracts large, long-exserted and reflexed.

Magnificent or California Red Fir.—*Abies magnifica*, Murray. Attains the largest size of any tree of the genus; on high plateaus and mountains of California; bracts mostly concealed; variety, *Shastensis*, Lemmon. Shasta Red Fir, near Shasta, bracts exserted. Variety, *Xanthocarpa*, Lemmon. Yellow-fruited Fir, near Webber lake, cones, yellowish.

SEO. 2.—*Microcarpa*—White Fir, cones smaller; bark whitish within; leaves longer, mostly flat.

GRAND, OR OREGON WHITE FIR.—*Abies grandis*, Lindley. Large trees of the Northwest and reaching California. Leaves dark green.

LOW'S OR CALIFORNIA WHITE FIR.—*Abies Lowiana*, McNab. Common in the California mountains at middle altitude. Leaves whitened below and twisted at base.

GRAY LEAVED OR COLORADO WHITE FIR.—*Abies concolor*, Lindley. Summits of the watershed of the Colorado river, including the San Bernardino mountains of California. Leaves, large, whitened above and below.

DOWNY CONE OR SUB ALPINE FIR.—*Abies lasiocarpa*, Nuttall. Rare on high peaks of the Northwest. Cone scales bearing short, brownish hairs. Leaves small and very short.

BEAUFUL OR BRISTLE-CONE FIR.—*Abies venusta*, Sargent. Extremely local in the Santa Lucia mountains of California. Cone-bracts

the honey extractor. The honey runs from the extractor into iron tanks, shown below the honey house, which hold 8000 pounds each, where it is allowed to stand for one or two weeks, and is then drawn off through a molasses gate into 60-pound cans for the market.

This apiary made 27,000 pounds of honey last year and 9480 pounds this year. The hives are the Ventura county standard. They are really a ten-frame Langstroth without portico, and have a loose bottom-board. A blue queen-excluder is used between the upper and brood chamber and a painted duck-cloth under the cover. The apiary contains at present 475 colonies in large hives, and 100 nucleus hives for fertilizing queens. The nucleus hives have been added since the picture was taken.

The orchard back of the apiary contains nearly every kind of fruit, but the oranges and lemons are most profitable. Above the orchard on the hillside is the Sespe Land and Water Co.'s flume, which carries water to the orange and lemon orchards in the valley below. The water is taken from the Sespe river, which shows a little over the honey-house. The hill above the flume is a foothill at the base of San Cayetano mountain, on the north side of the Santa Clara valley. The mountains in the dim distance are a spur of the San Fernando range, which run down from Newhall on the south side of the Santa Clara valley. This valley is about three miles wide at this point, the conjunction of the Sespe and Santa Clara rivers, and is good orange and lemon land for ten miles above and below.

The Southern Pacific railroad runs down this valley from Newhall to Ventura. Fillmore is the town at this point; it has been built since the railroad came, about four years ago. Santa Paula is an older and much larger town; it is eight miles down the valley, is the center of the petroleum business in this county,

ALUMINUM AS A FLASH LIGHT, for photographic purposes is proposed. It is said that a mixture of powdered aluminum and chlorate of potash gives a brilliant flash without the smoke produced by magnesium.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE CLINTON CON.—*Ledger*, Oct. 17: The company are erecting vast surface improvements, and this would naturally lead to the conclusion that they have a paying property. The company are certainly employing a large number of hands, never 50. An engine and two large boilers were hauled by Picardo's team from Lone to the Clinton Con. last week. They aggregated 20 tons in weight. The company continue to make extensive improvements of a solid and permanent character. At the Kennedy, they are engaged in sinking the sump in the main or south shaft, below the 1450 level. The work of opening up a new level at 1450 feet will commence about the first of November. The shaft at the South Eureka has reached a depth of 190. It is still in the slate of the mother lode formation, with stringers of quartz occasionally met with. It is probable that, before the end of winter, drifting will be inaugurated.

NEW YORK MINE.—*Dispatch*, Oct. 17: Several tons more of castings for the New mill at the New York mine were brought up this week, and the remainder will be there in a day or two. Everything is being pushed ahead as rapidly as possible, and the new mill will soon be grinding out the precious metal.

Calaveras.

MURPHYS MINES.—*Prospect*, Oct. 17: The dazzling richness of the mine of Marco, the Austrian, situated at Indian creek, is now the absorbing topic. Marco's mine is near the place of old Fredrick above the Esmeralda. That section was prospected several years ago by various persons and some rich threads of quartz were then discovered. They were so small, however, that the claimants eventually abandoned them. Subsequently Marco and his partner began a tunnel upon one of the small traces and were bappy to find that the vein widened and continued to do so until now there is a vein of a foot or more. Visitors to the place affirm that it is the richest mine known in these parts and that the rock literally clings together with gold. The old Green mine at San Domingo now the property of A. Shaw is shut down at present although the work done by the present owner was encouraging. A good custom mill somewhere around Murphys would be a good thing and be an incentive to opening and prospecting mines that might ultimately lead to something extensive. The old Washington mine at Indian creek, commonly known as the Woods, is progressing in a satisfactory manner, while the splendid new mill being built is daily nearing completion, and by the first of next month, it is thought, will be ready for operation. That section is at present undergoing a boom, and rumor says that all the available discoveries that have ever been made are being gobbled up, and prospected by speculative persons. The project of running the tunnel through Douglas hill by McCormick, Bisbee, and Thomas, is still prominently before us. Mr. McCormick is expected to be up this way soon to make arrangements together with his partners to start the work. Some preliminary moves will necessarily have to be made and then the work of running a long tunnel will be earnestly commenced. This claim will employ about 20 men, and it will take about one year to complete the tunnel through the hill. Then a large flume will be put in and deposit its tailings on the Calaveras side.

WEST POINT.—*Cor. Calaveras Chronicle*, Oct. 17: Our mining interests are doing well. Considerable bullion has been sent from our district within the past month, besides rich rock that has been sent below to be worked. The Lone Star, Blazing Star, Paddock, Riverside, Herbert and Bardsley mines are all taking out rich rock which will net well up to \$100 per ton free milling. We understand that the old Woodhouse mine has been sold to Mr. Hill and other capitalists from Michigan, who have already commenced to develop this valuable property. Work has already been pushed forward in a business manner, and contracts have been let to Mr. Kilgore and others for its development. In the near future we will once more see the old Woodhouse one of the producing mines, as it was in the days of '50 and '60.

QUAKER CITY.—The work of timbering the Quaker City mine is proceeding satisfactorily.

HARDENBURGH.—Good track is being taken out of the Hardenburgh mine at Middle Bar.

El Dorado.

MILL.—*Georgetown Gazette*, Oct. 15: Preparations are going on at the Darling mine for the building of a ten-stamp mill. D. C. Hart and Denver B. Craig are sluicing on Otter creek, on the Abbey claim, with good results. Mr. Barry Baldwin of San Francisco was up last Sunday on business connected with the Van mine. He returned well pleased with the plans now being carried out for the working and developing of the mine.

Humboldt.

PROSPECTING.—*Arcata Union*, Oct. 17: There is some stir in prospecting and locating claims in the Willow creek section just n.w. Several locations have been filed recently, the latest being on Monday last. It was that of the location of the Emma and Edith placer mines and was filed by U. Stewart, Edwin Meller, D. Shively and Henry Gramocini.

ASBESTOS.—*Arcata Union*, Oct. 17: The deputy State mineralogist who passed through this county two weeks ago made his stay too short to visit several deposits in the vicinity of Maple and Boulder creeks, where there are beds of magnesite, plumbago and asbestos, all of which are to be found at different points along the banks of those streams. On Lord & Sherburne's ranch an asbestos bed is now being opened, and if it proves as valuable as anticipated, a company will be formed to work the mine. One incentive to open this mine is the fact that silver is nearly always found in the vicinity of asbestos. There is much valuable mineral in our county, and no doubt but fortunes are awaiting the operation of enterprising prospectors.

COAL, GAS AND OIL.—*Blue Lake Advocate*, Oct. 17: A. Norton of this place has entered into an agreement with D. W. Minn by which the latter secures the privilege of prospecting for coal, gas and

oil on the 1140 acres of land belonging to Mr. Norton and situated on this side of the river. Mr. Minor, we are informed, is going to work with drills just as soon as the necessary arrangements can be made, and if coal, gas or oil exists on Mr. Norton's land in paying quantities, the fact will be established very soon. The place at which, we are told, the work will begin is about one mile from Blue Lake, where a vein of coal crops out of the ground. A number of specimens have been taken away from the locality which are pronounced superior in grade to any yet mined on the Preston ranch. Lignite, which the coal thus far taken out on Maple creek seems to be, is of more recent origin than the anthracite and bituminous coal series and not so good. The specimens shown from the outcroppings on the Norton place are either bituminous coal or a superior quality of lignite. The fact that gas escapes from fissures in the ground on the Norton ranch, and that the sandstone is manifestly impregnated with petroleum, is taken as proof positive that both may be found in larger quantities beneath the surface. Whether this trio of good things, or any one of them, exist in paying quantities, time will tell.

Inyo.

SODA.—*Inyo Independent*, Oct. 17: A large quantity of soda is being produced by the works at Keeler. On Tuesday, three carloads were shipped, and two or three cars are forwarded every trip. It is rumored at Keeler that the property has changed hands, that an English company has purchased the works and locations, and that the works will be greatly extended. If this is done, it will mean added prosperity for the farmers of this section.

BODY OF ORE.—Recent reports from Modock indicate that the largest and most valuable body of ore ever struck in Inyo county is in sight there. An expert miner who came in from there early in the week says that the ledge is very large and has every indication of being permanent.

Nevada.

CALIFORNIA MINE.—*Grass Valley Union*, Oct. 17: The prospects of the California mine, at Deadman's Flat, continue to grow more and more encouraging. The vein now below 200 feet is nearly the full width of the shaft, and the proportion of waste to quartz is very small, only about one in 12. The quartz now being taken out goes up by tests to \$45 per ton, mill process, while the sulphurets assay \$120 per ton. There are now 50 tons of ore on the platform and another platform is being constructed of larger capacity, so that when the new five-stamp mill is ready to start up, which will be about the 10th of November, there will be a good supply of ore to work on. The rich pay shoot in the mine, which was struck above, has not yet been encountered in the shaft, but will be when the shaft reaches about 20 feet deeper, where the quartz is expected to be of very high grade. To all appearances, the California will be a dividend payer in the course of a few months.

THE WYOMING CONS.—*Grass Valley Union*, Oct. 17: Yesterday morning the Powning vein in the Wyoming Cons. mine was struck in the crosscut which has been run from the bottom of the prospect shaft. This is the second vein cut by the crosscut. The Powning vein is the one that was being particularly sought for, as it is the same that gave excellent prospects many years ago. The vein at the point where it is now cut is 12 inches in thickness and of excellent quality, as it shows in free gold, galena and heavy sulphurets. The parties who are working the ground under lease from the company are highly pleased with their prospects, and have good reason to be from the appearance of the quartz, which is as good as has been seen from any mine in the district for some time.

THE GOLD FLAT.—*Transcript*, Oct. 17: The Gold Flat Mining Co., operating on Gold Flat, a mile and a half from this city, is a local corporation. The principal stockholders are John Skewes, John Glasson, P. F. Simonds, W. J. Mitchell, Mr. and Mrs. James Watt, Mr. Brown of Oakland, the Wasley Bros. (Samuel, Charles and Thomas), Edward Trengrove and a few other well-known citizens of this city and Grass Valley. The company owns the remainder of Gold Flat quartz claim, as it is called, and holds bonds on the Gold Flat, Potnsi and Mohegan claims. All these properties are patented and together embrace about 40 acres of land lying in the mineral belt a quarter of a mile below the famous and long-lived Pittsburg mine and between that and the New England (or Thomas), which has also produced largely in former years. The company began work two months ago, erecting one of the best hoisting and pumping rigs in the county on the old Bruce E. Lee incline, within the limits of the Remainder claim and some 50 feet from the N. C. N. G. R. R. The machinery, which has for its motive power two Pelton wheels, is covered by a new building 26x76 feet in dimensions, and close to it is a magnificent site for the mill, which will be constructed later. The land is covered with an abundance of timber for mining purposes. The large double-compartment shaft sunk by the former owners, who went down 300 feet and from the drifts run took out considerable high-grade ore and not a little of "specimen quartz," has been cleaned out and timbered by the Gold Flat Co. for a distance of 40 feet from the surface. Within 20 feet more they will reach water, below which point it is pretty certain the workings will be found almost, if not entirely, in their original perfection. The water will be pumped out by the close of this month, and then a drift to tap the Potnsi claim, which was worked to water level in early times and gave very large profits, will be started. At John Tamblin's ranch, on the ridge 1900 feet southeast of the works, a reservoir has been constructed, and the water for turning the wheels is to be purchased from the South Yuba Co. There will be a fall of over 300 feet. The laying of the pipe line to connect the reservoir and the hoisting and pumping machinery is nearly finished. John Skewes, one of the best mine managers anywhere, and under whose administration the North Banner mine was so successfully opened, is the superintendent in charge. The company is out of debt, and with the splendid location and capable management, it is pretty certain to soon be among the dividend payers.

THE TELEGRAPH MINE.—*Grass Valley Telegraph*, Oct. 17: Buildings are now being erected on the Telegraph mine to inclose the machinery which is ready on the ground to be put in place. The Telegraph adjoins the W. Y. O. D. mine, and is certainly favorably situated for a good future.

The shaft on the mine is down 110 feet and all the machinery and everything else paid for to date.

IDAHO MINE.—Supt. Edward Coleman informs us that the water will be entirely out of the Idaho mine to-morrow and that on Monday all manner of work about mill and mine will be resumed in full blast.

MINES TO BE WORKED.—The Green Mountain and Sanders mines, owned by Elam Biggs and Wm. George, have been handed to John Rawling Sr., Alfred Kinsman, John Abraham, Joseph Bartell, Henry Ford, Richard Gluyas, John Wellington and Wm. Reed, all working miners. The hood runs for three years and is in the sum of \$25,000. The Green Mountain has been worked only to 150 feet of vertical depth and the Sanders to about 200 feet. The joint product, with this shallow working, has been \$170,000. Some of the ore has yielded \$372 a load, and the average has been high. Work will be done through a shaft on the Sanders mine, on which there is good machinery. The new proprietors expect to have the water out of the shaft by the 1st of November.

Placer.

THE THREE STARS MINE.—*Herald*, Oct. 17: We learn from Supt. Werry that the work of pumping the water out of the Three Stars mine was completed last week, and on Saturday the first shot was fired in the bottom of the shaft toward sinking it deeper. The rock that was loosened by the blast showed liberally in free gold and all concerned feel very much encouraged. Two of Mr. Werry's old miners, Stephen Johns and John Murley, of Colfax, came down Monday to go to work in the mine. When the Three Stars was last worked by the lamented Hawkins and Pearson boys, who lost their lives in the mine by an accident, it had the reputation of being notoriously rich, and the indications all go to show that its richness is not a thing of the past.

FROM AN OLD MILL.—The old Pelster quartz-mill on North ravine was recently torn down and moved away. Henry Mundt, with a knowledge of quartz-mills and an eye to business, bought the right to clean up or mine the ground where the mill stood for \$100. It only took him a few days to wash the dirt and he cleaned up between \$400 and \$500 worth of amalgam, making something like \$300 on his speculation.

Plumas.

QUARTZ.—*National*, Oct. 17: Gus Wolters of Crescent has been working some very fine quartz in the Crescent mill from his ledge on the hill near the Southern Eureka. The old Kettle mill at Round Valley is running steadily on rock from the McGill and Standart Con. quartz mine with good results. This property is under the management of that prince of quartz miners, Geo. Standart, and hides fair to be—if not already—one of the best quartz properties in the country. The John Bull mill, in North canyon, below Round Valley, under the management of Samuel Firststone, is running on rock from the Johnny Bull mine with good success. Last week we mentioned the fact that Thomas & Thompson proposed to raise from their tunnel in the Fairlake mine. We are pleased to note this week that a fine channel of gravel was reached Thursday at a height of 15 feet. This enterprise is an assured success. Mr. Whitney of the Crescent mine is on the last 50 feet of his shaft, with the indications favorable for a permanent mine.

MINING NOTES.—The mining interests of this section are booming at present. The Eclipse quartz mine of this place is running in full blast, under the management of Mr. E. D. Bowman. The Good Hope mine of Buckeye is at a stand-still, with A. Holtz as superintendent. W. A. James & Sons are pushing their tunnel ahead in bedrock, but expect to strike gravel soon. Turner & Co. are pushing the Red Slide ahead as fast as possible. N. Mullen is running the Blue Nose tunnel ahead, with no signs of gravel yet.

San Bernardino.

THE TIN MINE.—*Los Angeles Express*, Oct. 17: United States Marshal Geo. E. Gard has been spending a few days at the Temescal tin mines. He says he found the company working 113 men, only 20 being Cornishmen, and 12 of those having lived in California from 10 to 30 years. About one ton of pig tin per day is being turned out, with 40 men working in the mines, and the ore is being taken from a four-foot vein and averages eight per cent tin. The 60 mines of tin in Cornwall, England, average 1½ per cent tin, but the labor there is much cheaper than it is here. There wages are about \$5.50 per week; here they are about \$2.75 per day. They are taking out 60 tons of ore per day. This ore is manipulated on a five-stamp mill and two pneumatic crushers with a capacity of 24 stamps each. It then goes through a refining process by hand, after which it passes to a concentrator, from which it emerges about 70 per cent fine tin. It is then mixed with ten per cent anthracite coal and two per cent of lime, and placed in a furnace to flux, the heat for this process being furnished by burning oil. It remains in this state for hours, when it is run off into kettles, the dross separated from it and molded into pigs, each pig weighing 60 pounds each, worth 22½ cents a pound, or \$500 per ton. Besides the vein, which is at present being mined, there are 500 veins on the property within a distance of 700 feet from the one being worked, and the operators claim that there are 30 veins traceable on the property. Two shafts are now going down on two other veins. One is 30 and the other 60 feet deep. The development of the lead now being worked is in two levels, the lower one being 182 feet deep, the upper level being 400 feet long. Arrangements are now being made to crosscut the lead. The lead now being worked is called the Calajco. Enough water is now being pumped from the river to furnish all purposes of the work. The company is nevertheless building a dam at the mouth of the Temescal canyon, 2½ miles away, and is sinking to bedrock to get foundations. Not only is enough water to be stored here to supply all possible work of the mines in the future, but enough will be had to irrigate about 3000 acres of adjacent farming lands, upon much of which the miners will live. The money invested here by the English syndicate who owns it is not less than \$750,000. A report recently made by the superintendent to the company's directors in England states that the mine is now on a paying basis, and that it will justify further development. The ore is entirely pure save a little copper and iron found in all tin ores, and which no account of is taken.

San Diego.

JULIAN.—*Sentinel*, Oct. 14: The Helvetia stamps are busily dropping on hnanza ores. The ledge underground continues strong. After a short delay, work is again resumed upon the tunnel to the Big Blue. The Eagle boys are following a vein of very rich rock. C. E. Smith was quite severely hurt last week by a cave in at the tunnel he and Geo. Plant have been running near the Washington. The accident has compelled the men to start a new tunnel. The old stand-bys—the Ruby, Cincinnati Belle, Warlock and Gold King—are all working magnificent rock.

Shasta.

ELECTRIC DRILL.—*Shasta Democrat*, Oct. 14: An electric drill, the first ever used in California in mining operations, arrived here from the East a few days ago, consigned to the Gladstone Mining Co., whose property is situated on Kline gulch, in French Gulch mining district. The whole piece of machinery weighs about 12,000 pounds. With the latest improved machinery for drilling, the company will make very rapid progress developing their group of mines.

CLOSED DOWN.—The chlorinating works at Kennett have been closed down, and Mr. Price, the superintendent, will go from here to Arizona, and in December will start for South Africa, where Mr. Butters has been for a year erecting reduction works for an English mining syndicate. Upon the arrival there of Mr. Price, Mr. Butters will return to California, and, so we understand, will greatly enlarge his plant at Kennett.

THE NEW PROCESS.—*Redding Free Press*: The mill of the Shasta Gold Extraction Company, built expressly for the new English process, is all ready to put in motion as soon as they receive the chemicals now daily expected.

BULLION.—*Shasta Courier*, Oct. 17: Bullion to the amount of 28,000 ounces, was hauled through town last Tuesday, from the Last Confidence mine at Iron Mountain. The Bricks were shipped to the Selby Smelting Works.

Sierra.

GRAVEL.—*Mt. Messenger*, Oct. 17: We learn that gravel has been reached in the main tunnel at the Golden Giant claim, below the Mountain House. As we remember, three shafts were raised in this tunnel, the first two nearly 100 feet high. What distance the third was put up, we do not know.

CARNEY.—The Carney ledge, in Jim Crow canyon, where it has been recently crosscut, is said to be 30 feet wide, with 26 feet of good ore. Another crosscut, a thousand feet farther north, near the surface, has the same width and quality. The mill is run only about seven or eight hours a day, that being all the water will do. Mr. Wittenmyer of Martinez and Mr. Rouse of Antioch were up in Jim Crow canyon several days this week, examining the quartz mine owned by Jo and Jesse Carney. As we are informed, these gentlemen have advanced the money used in prospecting the mine during the past few months. Mr. D. A. Rouse has been superintending the work of exploration.

SIERRA BUTTES.—It is rumored here that the Sierra Buttes M. Co. has found such prospects somewhere in its mine as will warrant it in putting up another ten-stamp quartz mill.

Siskiyou.

GRAVEL.—*Yreka Journal*, 14: Work has been shut down temporarily at the Yreka blue gravel mine, but the directors are making arrangements to continue sinking the shaft soon again, in order to strike bedrock before winter, if possible. The Greenhorn blue gravel mine of Lee, Lash & Co. is paying big again, the rich channel having been found in their new shaft near stage road. This company has an immense area of rich paying ground, and will take out considerable gold from now on.

CHINESE WORK.—The Bentz Bar claim at Klamath river, near Honoluli, worked by Chinamen, is reported as yielding very rich returns. The Chinamen admit taking out between \$40,000 and \$50,000 this season, but it is the general belief that this is just about one-fourth of the amount they have realized. The Chinese claim, near the old Fort Jones claim, farther down the river, is also paying handsomely, and the Phil Mott claim still farther down stream on the Klamath has also been yielding an extensive quantity of the glittering dust.

QUARTZ.—A stage load of experienced miners arrived here by last Sunday's train from below for the Spencer quartz mine, on Humburg, and were immediately taken to the mine by four-horse team, which was at depot awaiting them. This mine is being worked energetically at present and is said to be paying well.

Tuolumne.

STANLEY.—*Tuolumne Independent*, Oct. 17: Superintendent McCann informs us that the Stanley mine is a paying property. He figured on the ore going \$250 per ton, but so far the ore milled went considerable above the expected figures.

NEVADA.

Wahoe District.

SAVAGE.—*Virginia Chronicle*, Oct. 15: During the week we have hoisted 531 cars of ore from the 500, 750, 950, 1100 and 1450 levels, shipped to the Nevada mill 525 tons, and milled 500 tons, average assay value as per battery samples of \$18.64 a ton. We have bullion on hand on October account amounting to \$9688.75. We have started work in the ledge from the main Suro tunnel, where it intersects our ground on the 1650 level.

HALE & NORCROSS.—On the 1100 level, from the east crosscut on our north boundary, we have extracted 72 cars of fair-grade ore. The main incline was repaired and retimbered 20 feet, making its total depth below the 1500 level 238 feet. It has reached the Suro tunnel level, through which we are now transporting the most of our waste rock.

KENTUCK.—The east crosscut from the bottom of the 1000 level north winze is in a distance of 12 feet; face in low-grade quartz. Are now up 21 feet on the ore streak above the south drift from the north rise.

JUSTICE.—The north drift on the 450 level was cleaned out and retimbered a distance of 45 feet

during the past week. The south drift from No. 2 crosscut, 622 level, was timbered 20 feet during the week; total length 195 feet.

CROWN POINT.—The main crosscut from the south lateral drift on the 600 level has now a total length of 162 feet; face in porphyry and streaks of quartz with considerable water running from it.

BELCHER.—The east crosscut on the 200 level has been run a total distance of 81 feet. It has passed through five or six feet of quartz yielding fair assays, which is being saved for pay. Have stopped the crosscut and are now running north from it on the quartz.

SEC. BELCHER.—The west crosscut from the south lateral drift on 600 level is out a total distance of 406 feet; face in a mixture of porphyry and streaks of quartz.

YELLOW JACKET.—Shipped to the Vivian mill during the week 40 tons of silver-bearing rock, and 100 tons of gold-bearing rock to the Santiago mill. The usual prospecting is being done.

SCORION.—The joint north drift, 900 level, has a total length of 544 feet; face in porphyry and clay. The water from the face is about the same as at the last report.

Lodi District.

PURCHASED.—Belmont *Courier*, Oct. 20: Alfred Welsh has purchased the Lodi mining property, situated at Lodi, Nye county. We learn that it is his intention to work this mine on a larger scale and that at least 20 miners will be immediately employed in extracting ore. The Lodi mine has produced large quantities of rich silver ore, and there are still large quantities of pay rock in sight. Lodi will soon be a lively camp again.

BRITISH COLUMBIA.

TRAIL CREEK DISTRICT.—Nelson *Miner*, Oct. 16: While other sections are having their excitement and stampedes, Trail Creek is by no means depopulated or overlooked by prospectors. While other districts may employ more men, Trail Creek claim owners are doing their share of development work. While other towns are putting on frills the town of Trail is certainly holding its own. All this is encouraging, and goes to show that the men who have spent time and money in Trail Creek district have faith in the future of the camp. A number of men are working on the Le Roi cleaning out the old shaft; when cleaned out, sinking will be resumed. A party of five prospectors have made between 12 and 15 locations on the summit of the divide between the North Fork and Sheep Creek, to the south of the trail. From assays obtained the ore runs about \$80 in silver, and when concentrated \$300 in silver and 55 per cent in lead. J. C. Boone, Andrew Simons and Arthur Finch have discovered a 10-foot ledge about 1½ miles north of the trail, from which they expect to make a stake, as it is a fine surface showing.

IDAHO.

AT FLINT.—De Lamar *Nugget*, Oct. 16: The mill at the Flint mines, which has had the stamps hung up for a fortnight, is now at work again. The stop was made to connect the well, sunk to supply water, with the bedrock under the creek. An ample supply of water has been secured. Twenty more stamps have been ordered, and the foundations are now being prepared for them. A new, large Corliss engine will be put in. J. D. Ludwig has again put a force of men on the Stoddard mine, and is sinking the incline near the south end of the tunnel. He will soon begin a shaft on the ledge near the west line of the property. The ore in the incline, he reports, is looking much better. The work recently done by Frank Lephay on his Ohio mine, southeast of the Stoddard, goes a good way toward proving that the great Wilson ledge continues south through the mountain. The ore is very rich, and the quartz of the same character as that in the Wilson. The same character of ore has also been found in the Midnight claim, 4000 feet further south.

MONTANA.

THE BOULDER DISTRICT.—Montana *Mining Review*: The Boulder district, in Park county, is rapidly gaining prominence as a mineral section. The owners of the Independent mine propose to put in a 10-stamp mill at once, with a complete process of saving all there is in the rock, an estimated loss of \$3 per ton having resulted from the method of treatment heretofore employed. The owners of the Crown are confident they also have a good property. The company operating the Hidden Treasure mine are putting up a 10-stamp mill at a cost of \$7500, and it is claimed they have ore enough in sight to pay for the mill. Their ore is quite rich, showing free gold. The Poorman Company is also putting up a mill of three stamps. They have uncovered a very rich vein of ore and are now sinking a working shaft, from which they intend to crosscut to the vein as soon as they have reached a sufficient depth.

NEW MEXICO.

SMELTERS.—Silver City *Enterprise*, Oct. 16: The Socorro and El Paso smelters are so crowded with business that they have been refusing ore from this section. This speaks well for the general prosperity of the country, but is a strong indication of greater smelting capacity needed at the points named or the erection of new works at this city. The Flagler Works of this city will soon be in the field buying and treating smelting ores, but unless its capacity is speedily increased, the local market will soon again be oversupplied. The Grant County M. & M. Co. of this city, which makes a specialty of low-grade silver ores, is crowded to its utmost capacity and is running day and night. The demand for greater facilities for handling the ores is so apparent that several mining men of note are contemplating the erection of a smelting plant in this city. The maiden brick of the Last Chance Mining Co. arrived Monday night. The brick weighed 46½ pounds, and carries considerable gold. It was valued at \$1227.60 and was the product of 7138 tons. The ore was saved fully as high as expected, considering that it was the first run made on ore. Judge Jno. M. Wright, the promoter of the enterprise, states that the run was satisfactory to the management and that the same ratio handsome dividends can be declared.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 13, 1891.

- 461,177.—SLAT FASTENER FOR BELTS.—M. Arnold, S. F.
461,402.—COMBINATION TOOL.—E. A. Cochran, Pasadena, Cal.
461,102.—HIPPODROME AERIAL RAILWAY.—J. B. Gerber, S. F.
461,346.—GAME APPARATUS.—E. Krehs, San Luis Obispo, Cal.
461,365.—PRESERVING TIMBER.—J. McKeon, Oakland, Cal.
461,120.—CULINARY BOILER.—F. McKinley, Acme, Wash.
461,361.—CAR VENTILATOR.—A. Minnick, Colton, Cal.
461,366.—EXTENSION LADDER.—I. H. Odom, Oakesdale, Wash.
461,172.—CULTIVATOR.—Jas. Porteous, Fresno, Cal.
461,049.—NEWSPAPER HOLDER.—W. C. Roberts, Sausalito, Cal.
461,174.—DIRT SCRAPER.—Smith & Hopkins, Fresno, Cal.
461,374.—HAY RAKER, ETC.—M. M. Sornborger, Round Mountain, Cal.

The following brief list, by telegraph, for Oct. 20, will appear more complete upon receipt of mail advices:

California.—Peter Bargion, Oakland, chair plate for compound railway rails; John O. Cottrell, Riverside, wrench; Isaac S. Goldmann, Redlands, coupling; Warner L. and E. C. Keller, Azusa, adjustable extension revolver stock; Paul C. Salsesvain, San Jose, gas or gasoline vapor engine; August Schilling, Oakland, box lining; Courtland Sims, Los Olivos, Santa Cruz, cultivator; Wm. W. Slater and H. C. Barnes, Oakland, bolling-attachment; Adolph Somers, Berkeley, lubricant; Andrew H. Weir, Los Angeles, car coupling; Sidney B. Whiteloid, San Francisco, stamp-rolling and change-returning machine; John T. Wilson, San Francisco, engineer's air-brake valve; Oregon.—John B. Mahana, Free Water, three patents, one for a locomotive, one for a car for single railway and a third for an elevated railway. Washington.—Remembrance L. Kirby, Pomeroy, whitetree, clip and hook; John W. Seibert, Medical Lake, propelling wheel.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order.) American and Foreign patents obtained and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SLAT-FASTENER FOR BELTS.—Matthew Arnold, S. F. No. 461,177. Dated Oct. 13, 1891. In the formation of what is known as carrier belts—such as are employed in harvesting and thrashing machinery—it is usual to employ two leather or other flexible belts, which are fixed to transverse wooden strips at short intervals, the leather belts traveling over supporting driving pulleys, and these, with the transverse strips, form the entire belt when used as a straw-carrier; but when used to convey grain or mixed grain and straw, there is an intermediate belt made of canvas or suitable flexible material extending from one side to the other and covering the transverse wooden strips. This invention is designed to provide a convenient means for securing the flexible fabric and belts to the wooden strips in such a manner as to firmly secure the parts together and to preserve the wooden strips from danger of splitting and breaking while in use. Hitherto it has been customary to secure these parts together by boring holes through the wooden strips near the ends and riveting the fabric to the strips. This inventor employs inclosing clamps or rivets made in the form of hauds stamped out of sheet metal. By using this, the strips are held in place firmly, and cannot split or break.

DIRT-SCRAPER.—Daniel W. Smith and James K. Hopkins, Fresno, assignors to James Porteous, same place, No. 461,174. Dated Oct. 13, 1891. This is one of that class of dirt-scrapers in which the turning bowl is provided with a stop bar adapted to limit the dump of the bowl by contact with the draft links. In this class of scrapers it is desirable to limit the dump of the bowl both to regulate the discharge of earth therefrom and keep the handle from falling too far forward. This limitation is effected by means of what is known as a stop bar, which extends across, above the bowl, being secured at each end, usually to the arms of the bowl. It is also desirable to provide for the adjustment forward and back of this bar in order to limit the dump of the bowl at different points, to regulate the distance of the bit from the ground and thus govern the discharge of the dirt. This has heretofore been done by means of holes made in the arms on which the bar rests and bolts passing through the ends of the bar and adapted to fit in any of the holes on the arms, whereby the bar may be moved to and secured in different positions. These bolts become rusted very soon and it is very difficult after the bar has been in place for any length of time to remove the bolts in order to adjust the bar. Another difficulty with this old form of connection is that the arms in which the holes are, get bent and out of place, so that it is difficult to get the bolts out and put them back again. Also, as the bolts have to be wholly withdrawn from the holes each time the threads become injured, materially affecting the life of the bolt. The object of this invention is to provide a means for securing the stop bar to the arms, of such a character that said bar can be readily loosened and moved to adjust it at different places.

CULTIVATOR.—James Porteous, Fresno, No. 461,172. Dated Oct. 13, 1891. The blades or teeth of cultivators, after being in use, get dull and become beveled on their under edge to a plane parallel with the horizontal line of the frame to which they are attached. Now if the teeth are so connected with the frame that they can be moved through a slight arc, it is obvious that a new line of contact of their beveled under sides with the earth will be presented and further use will therefore

sharpen them, and this will continue until a full fresh bevel is formed when the teeth will get dull again. Then a second adjustment is required to again place them at such an angle that they will sharpen themselves. The object of this invention is to connect the teeth with the cultivator frame in such a manner that this adjustment may be readily made and also that an adjustment up and down may be had according to whether the teeth are working in hard or loose and sandy ground.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 22, 1891.

General trade continues fairly active, with the more distant and outlying points large buyers for winter custom. While complaints of trade being dull are still heard, yet it is the exception rather than the rule. The local money market is exceptionally easy for the season of the year. There is a larger reserve than for many years in this month. For the lack of something better, speculators are attracting attention to realty, with the view of getting up another land boom. They are encouraged by the lifeless character of all speculative securities and the increasing supply of money. Mail advices from New York report more funds seeking investment and a gradual shading in the rate of interest. The bank statement reflects the large gold imports. The increase in specie holdings is \$5,918,000, and the increase in surplus reserve \$3,536,000. The surplus is now \$6,639,000, as against \$3,155,000 one year ago and a deficit in 1889. A leading New York exchange says that in regard to prospects, several leading bankers agree in the belief that something like \$50,000,000 of the \$75,000,000 shipped since last spring will be returned. On the other hand, the purchase of American securities on foreign account has fallen off as well as the exports of cotton, at the same time that imports of merchandise are remarkably large. In the month of September there were brought to the port of New York \$39,385,181 of merchandise against \$48,876,281 for the corresponding month of last year, when goods had been ordered for the purpose of antedating the new tariff. Exclusive of specie, the entries have been larger than for the same month of any former year, except the last and the year 1882. Exports, however, show a still larger increase, the gains being upward of \$8,000,000. Exclusive of specie, the total is \$37,949,351, the largest for September known in the history of the port.

According to the New York *Financial Chronicle*, 140 lines of railroad, representing all parts of the country except New England, earned \$45,204,504, which is \$3,731,800 more than last year, showing an increase of nine per cent, and the comparison is with a month of very good earnings last year. The earnings were swelled mainly by the increased grain movement, which was simply enormous.

MEXICAN DOLLARS.—The market is quotable at around 77 cts. The steamer that left to-day for China took out \$203,337.

QUICKSILVER.—Receipts the past week aggregate 293 flasks, and the exports by sea, 19 flasks. The market is strong under a fair demand and better markets abroad.

SILVER.—The market is essentially unchanged. Leading Eastern financial papers estimate the year's output of the mines in this country to be larger than for several years past. The increase is said to be due to various causes, the chief being the successful working of lower grade ore. While bankers' conventions are declaring against the free coinage of silver, farmers and labor organizations are taking a more decided stand in its favor. The moneyed interests of this country, England and Germany have, for two years past, opposed silver, the money of the poor and middle classes, and also of farmers and producers in general.

BORAX.—There is nothing new to report. The market, which gave signs of strengthening, is slightly easier. Continued free shipments are being made eastward.

ANTIMONY.—Eastern advices confirm previous received information of a strong and higher market. Better prices at the East will stimulate production with us.

LEAD.—The market continues dull with an easier tone reported. Eastern advices report that holders were disappointed in their expectations of a better market under an active consumptive demand, and consequently, to stimulate purchases they made concessions.

TIN.—There is absolutely nothing new to report. *Iron Age*, in reporting the New York market, says: Managing the pig tin market seems to be a difficult job for those engaged in it, and forming a working idea of what the leaders are really up to is something that evidently mystifies the rank and file. At intervals when the surface appearances suggest a break, the market is given a little turn upward, and no sooner does sentiment turn than reaction takes place. The pendulations are not great, yet sufficient to keep the outsider in a state of uncertainty and cause consumers to buy cautiously. A London cable says: In tin plate there has been more business. Some good Russian and Frisco lines were booked. American buyers seem more inclined to business. Exports last month, 26,000 tons, of which 17,000 tons to the United States, against 35,000 tons and 25,000 tons respectively in September, 1890. Stocks at shipping points show large increase.

IRON.—Imports the past week aggregate 600 tons from Newcastle, England. The market for both spot and nearby is in favor of buyers. Oregon and Washington reports an increasing consumption, with a much larger increase in the year 1892. Eastern advices report a firm market, notwithstanding a large increase in the weekly output, being now over 181,000 tons against nearly 161,500 tons on January 1, 1891.

COPPER.—Exports the past week aggregate 280 tons copper matte to New York. The market has a lower tendency, due to the increased output in Chili and the near approach of the time for the Anaconda mine to start up. A London cable under date of October 14th says: Early in the week the copper market was depressed by rumors of reopening of the Anaconda mines and reported sale of Societe des Metaux works and stock. Later on prices

improved under the influence of purchase to cover "short" accounts and better buying on the part of consumers. There is still a feverish feeling, due to uncertainties regarding Anaconda and the French interests.

COKE.—Imports the past week aggregate 200 tons from London and 300 tons from Newcastle, England. The market is about as heretofore reported.

COAL.—Imports the past week aggregate as follows: Newcastle, N. S. W., 7029 tons; Departure Bay, 4750; Comox, 4500; Seattle, 2400; Tacoma, 4000; total, 22,677 tons. The market for spot and nearby is in buyers' favor, with concessions obtainable, but for shipment Australia is slightly higher, with English quite strong. The consumption in this State for steam and other purposes is the largest on record. Those in position to know affirm that the consumption throughout the winter months will not show any signs of falling off.

Mining Share Market.

Mining shares, the past week under review, met with a slight setback in both the Middle and North End shares, but the Gold Hill shares held fairly firm. The firmness of the latter, with the others shading off, looks very much as if they are being concentrated for an up move. Whether an advance in them will be based on developing work, or the usual assessment racket, there is a difference of opinion, which time alone can solve. Among well-informed miners and also usually well-informed operators, there are vague, mysterious hints of rich ore bodies that can be shown up by the managers of the Gold Hill mines when active work is begun on the levels that are being drained or pumped out. They claim that the late Wm. Sharon left the ore for future use. Many are inclined to doubt this report, for they claim that Mr. Sharon's life history while on the Comstock, is not such as to warrant the belief that he left anything that could have been taken. Be this as it may, as the water is lowered in the Gold Hill mines, their shares appreciate in value, and this, too, with the certainty that a line of assessment is to be levied before the close of the year. In outside mining shares there has been more doing in the Quijotas, Bodies and Tuscaraas, but quotations do not show an advance.

In last month this paper made mention that M. W. Fox, president of the West Con. Virginia Mining Co., had made application before Judge Rising, Virginia City, to order a survey of the west workings in the Con. Virginia mine. This application was made under the belief that the latter mine had taken out ore from the west ledge claimed by the former company. Owing to the Judge visiting this city, no decision was rendered until to-day. A telegram received from Virginia says: "Judge Rising dismissed M. W. Fox's application for a survey of the mine (Con. Virginia) on the ground that under the statutes the court has no jurisdiction to make an order of survey, unless suit is first brought." We understand that a suit will be brought at as early a day as possible.

Continued evidence crops out from time to time of the correctness of the MINING AND SCIENTIFIC PRESS's long contention that there is a well-defined lode west of the Comstock. The latest proof by direct work of a west lode is a confirmation of an improvement in one of the Silver Hill mines. The Virginia City paper in referring to the development says that 1000 feet south of the Daney mine, prospectors have encountered the continuation of the Daney ledge that was 30 feet wide at the 500 and 900 foot levels, but which was barren. At a depth of 65 feet on this new discovery it shows a width of 18 feet of reddish-brown quartz—gold-bearing. This ore assays about \$20 per ton, \$17 of which is gold. Water coming in at this depth, pumps will have to be erected before the prospectors can go deeper.

Yesterday (Wednesday) mining shares exhibited more strength under Con. Virginia's leadership, resulting in still higher prices on regular call this morning. The up move is generally considered a bluff on the part of the pool, so as to make a few shorts fill, after which bring Con. Virginia to \$4 or less.

'News from the Comstock mines continues as scarce here as hen's teeth, which is confirmatory of previous statements that the pool has succeeded in getting miners who know nothing (unless it is to the pool's interest) after they get out of the mines. Those in position to know are very sanguine of good results from running the west drift in Mexican, near the Opir line. In Sierra Nevada they ought to soon report an improvement, but perhaps the assessment on it and the one on Utah will keep back the work for a short time. The rich strike in Gould and Curry, made to the west by "Jim" Rule, was on the tunnel level. The ore is still there, although from another level ore has been extracted. It is thought by some that the Gould and Curry ore will be taken out by the Savage Co., and if so, they think that both companies will levy assessments to pay for the work, while a reported ring gets away with the bullion. In Hale and Norcross, new but very important work has been commenced. Savage reports the usual active and encouraging news from the work under way on the several levels. Is it not about time for the Potosi Company to show up the good milling ore reported some time ago, found on the 1100-foot level? But then perhaps another assessment may be required first. Bullion has good milling ore that can also be shown up. Information of a favorable character from the Ward shaft west workings is kept back. As it is nearly time to assess Con. Imperial and Confidence, there ought soon to be good news put afloat from that group. It can be, but hardly likely done on a legitimate showing. In Crown Point another strike is reported, but it is water as usual. The superintendent of that and the Yellow Jacket mine is a "lightning striker" for water, while the management is good at striking stockholders for assessments. The official news from the Gold Hill mines is of a very favorable character. It would not surprise the writer if one or more of the mines in this group should begin extracting ore by spring of 1892, that will return a handsome profit over and above all expenses. Important but secret work is reported in the Alta group.

Experienced miners are very confident that much better news will soon begin to come to hand from the mines in two of the outside districts.

MECHANICAL PROGRESS.

The Blacksmith and His Work.

The smith shop of a carriage manufactory is one of the most important departments of the industry, and one that requires as much skill in its way as any of the others. While it may seem an easy matter to heat iron and hammer it into the required shape, the trials of the blacksmith are equally as great in the successful treatment of his material as those of the worker in any of the other departments.

The proper degree of heat may not have been attained, which causes an unsuccessful weld; then, again, the iron may get too hot, fusing it and destroying its usefulness. The material itself may be faulty and uneven of texture; and then he must treat irons of different kinds, frequently varying greatly in quality and requiring altogether different manipulation. Again, he cannot be so exact and produce so finely executed a job as his brother wood-maker, who has altogether different materials to work upon and finer tools to use.

But we might continue the category of the difficulties the smith encounters in a countless number of details, until our readers were convinced that the hardest and most trying trade of the present day was that of a blacksmith; but such is not the fact, and if a blacksmith does have to endure some inconveniences, and his duties are laborious as a general thing, he receives as much, or more, than the worker at other portions of the carriage trade; and in regard to the arduousness of his labors, whether they seem hard to him depends upon himself, as what may be irksome to one, another may take pleasure in doing.

However laborious the work of a blacksmith may be, it is very much easier at the present day than in earlier times, when the brawny arm and the hammer were the potent elements in fashioning the rude iron-work, when the nails even were wrought out by hand (and who has not seen the curiously wrought hinges, door-handles and many articles of every-day use which are frequently seen in the highways even now). Then there were no cunning and powerful machines to lessen the labor of man and multiply his hands a hundredfold—the giant iron and steel rolling machines and their twin brothers, the huge iron and steel cutting machines that bite off the thick plates and bars as easily as one would cut a piece of cheese. These monsters, backed by an ever-lengthening retinue of assistants in the drop-hammers, whose weight is graded by the ton, and whose execution is only measured by the law of force; the trip-hammers, the younger members of the family, and the powerful steam dies and punches, and a countless number of lesser agents, all willing helpers of man, their master, now make the labor of the blacksmith very much easier.—*Amesbury Vehicle.*

Valuable Railroad Inventions.

What is pronounced by leading railroad men the most important invention during the last 25 years applied to the railroad business was recently exhibited for the first time at Indianapolis. It is a car scale, and is a simple piece of mechanism, which can be attached to any car, the weight of which and its contents is shown with perfect accuracy. The weighing of cars heretofore, when given any attention at all, has been chiefly a matter of guessing, and the consequent losses of the railroad companies from overloading have been enormous.

Another important invention in this direction is a new steel-tired wheel for railroad cars. The difficulty heretofore experienced of securing a tire capable of being placed in position without bolts has been overcome by this invention which not only does away with bolts but at the same time admits of a steel tire that will wear much thinner than those ordinarily in use. This result is obtained by means of a peculiar fastener, consisting simply of a notched plate that is placed between the tire and the wheel—the alternate projections on the plate being then bent into a groove in the tire, while the other projections are bent around the edge of the run of the wheel. By the adoption of this method perfect stability is given to the tire, and not only this, but it can be worn much thinner when thus fixed in position than by the old process of employing a simple flange for the same purpose.

Still another improvement, and one which is claimed to meet an important desideratum, is a self-registering signal—a device for preventing any mistake in interpreting a signal given on a gong, especially when five or six strokes are sounded. Ordinarily it is only by strict attention that an engineer is made sure of the exact signal given, and if confusion of any kind should cause him to lose count of the taps on the bell, no means are afforded him of verifying his understanding of the signal. The method which has been resorted to in avoiding this uncertainty is a mechanism by which each blow is clearly and distinctly registered; that is, upon the dial the index finger stands at zero until the signal is given, when each blow is recorded on the dial as struck, this registration remaining on the dial until changed, even if the person for whom the signal is intended be absent.

STEEL POWDER IN PLACE OF EMERY.—It is stated that steel powder is very well adapted for polishing stones, and that it can replace emery with advantage. It is obtained by

lightly sprinkling overheated steel with water. The metal then becomes friable, and is easily reducible to dust by stamping. The powder distinguishes itself from emery in that it is more keen and biting in its effects, and cheaper, while at the same time it leaves a finer and more durable polish.

Labor Saving Machinery.

Now that machinery does so much of the drudgery that has so long held men down, it calls for more active mind, and it gives an opportunity to some to spend many hours of each day in thinking of any subject. The result is either very good or very bad, and it depends on the man. If he lets his thoughts run loose it is only a question of time when his actions will bring disgrace to himself and those near to him, but, on the other hand, if he realizes the value of these spare moments for mental development he will surely make a success.

Some men have attained success and still been given to degrading habits, and these very ones are often held up as shining examples. But we should remember that there is a small chance of our being built right to do as they did; that these cases are exceptions to the rule; that greater results would have been attained if these men had devoted all their energies to the mind's development, and that degrading habits harm the senses, physical and moral, is an undisputed fact.

Just what branch of shop work each one should study is not easy to define, but the studious habit once acquired will surely work out all questions. It is not enough to be a good mechanic. If a man is nothing more than a good mechanic he is not the man for taking charge of work. If he is only an inventor he will never stand much chance of receiving any good return for his days and nights of study. Yet, it must be borne in mind that these days of study and thought are absolutely necessary in the successful man's life, but the study of mechanics must always be supplemented by a study of the field. If the aim is in the line of invention, patent laws must be studied, and the condition of the market must be known. If it is for fitting the mind for any opportunity that chance may offer, it is necessary to study thoroughly all the mechanical problems and shop ethics, taking each separately. It is foolish to say that we are so much the creatures of chance that we stand a small show of any good opening, and that all this close application of the mind to work is of no use; that preachers and successful men think that success comes solely from hard work, and that the successful "pat themselves on the back" when they think of it. Hard work is essential, but it will surely be foolish for anyone to let this kind of logic deter them from doing all that lies in their power for self development. For if they are unfitted, how will they be able to take advantage of an opportunity?—*Scientific Mechanist.*

WEIGHT OF MARINE MACHINERY.—Mr. C. H. Wingfield writes on the above important subject as follows: "In discussing a paper at a recent meeting in London of the Institution of Naval Architects, I pointed out that it is incorrect to assume that the whole weight of machinery in a ship varies as the horse power. More power may often be obtained from a given engine, shafting and propeller, by simply spinning them faster, without adding to their weight, and the weight of these parts, and perhaps of the shaft fittings also, varies as the revolution power (or horse power per revolution) much more nearly than as the indicated horse power simply. It is sufficiently correct, with a given type of machinery, to say that the remaining weights do vary nearly as the indicated horse power, and I suggested that a tabulated statement of weights would show more clearly how the weight per indicated horse power had been reduced in past years, if the weight of main engine, shafting, shaft fittings, and propellers were given separately from those weights which follow a different law, instead of 'lumping' all together under the name of 'engines' or 'machinery,' as has been done in every table of weights I have seen. If these are given separately, I see no objection to their weight per indicated horse power being stated, provided that the indicated horse power and revolutions are also given."

THE SEAMLESS BOAT, pressed out from an ingot of steel and shaped by hydraulic power, an English invention, is considered in England one of the latest triumphs of human ingenuity. It is claimed for these boats that they will last twice as long as wooden ones, that there is less danger of their capsizing, and that they are less liable to be affected by changes of climate. This method of producing a boat has already been mentioned in these columns, and is simply a larger application of the method which has long been used in this country for manufacturing cooking utensils and other articles of small dimensions.

SISKIYOU MINES.—The mining industries of Siskiyou county are now attracting a great deal of attention, both at home and abroad, and more good mines are being discovered right now, and more interest taken, than at any time since the "good old '50 days." Although the mineral of Siskiyou may not exceed that of many of the Southern counties, she is not hampered by any legal restrictions to render the best mines impracticable of working.—*Siskiyou Telegram.*

SCIENTIFIC PROGRESS.

Improved Astronomical Observations.

There are perhaps no observations in astronomy which require greater accuracy than those of star transits. Heretofore the dependence has been confined to the eye and ear. The eye must observe, the month transmit, and through the ear of a second person the record must be made; or the observer must watch the motion of the star and at the same time count the seconds by the ticking of the clock. Manifestly such a mode of observation must be attended with much inaccuracy, when the small fraction of a second is important. Personal equation must enter largely into the chances of error.

According to the New York Sun, a young Jesuit priest, Rev. Geo. A. Fargis, has just made an important improvement in astronomical methods of this class, by applying photography to the observation and thus compelling the star to make its own record of its transit. In measuring and determining the relative distances and positions of the heavenly bodies, it is absolutely necessary to ascertain with absolute precision the time of transit of a star across the meridian at which the observation is made.

Some years ago the chronograph was invented to remedy the errors of the ear. In this instrument an electric current recorded the time of the transit. The introduction of the chronograph did not do away with all errors, however. Scientific men said that if the star could be photographed, it would record its own transit.

Experiments were made to attain this end, but nothing practical was done until a few weeks ago. Under the direction of Rev. John G. Hagen, director of the Georgetown, D. C., College observatory, Fr. Fargis took a hand in the experiments. The instrument he has devised is very simple.

In a tiny camera, attached to the eye-piece of the transit instrument, a highly sensitive plate is inserted. Electric connection is made with a sidereal clock in such a manner that a narrow shutter or bar is moved up and down before the plate cutting off and admitting the light of the star at stated intervals during its passage across the field. The image of the spider line is afterward impressed upon the plate by the light of a lamp held for a few moments before the object glass of the telescope. By means of the shutter, or bar, this light is prevented from interfering with the star trail on the plate, which may be subjected at any time to repeated examinations and measurements with a microscope. The registry of the transit is said to be so accurate that the time can be determined within the one-thousandth part of a second. Fr. Fargis has used his device in observing several hundred transits. His contrivance, it is said, may be applied with accuracy to many other purposes in astronomical work. The Smithsonian Institution has printed an account of Fr. Fargis' invention.

A NEW PYROMETER for which special claims are made owes its origin to Professor Roberts-Austen. It is notorious that two different metals in contact produce a current of electricity when the junction is heated, and this current increases in strength in proportion to the temperature of the junction. It follows that the current sent through a galvanometer becomes a measure of the temperature of the junction. If such a junction is put in a hot place, say the furnace, and connected by wires to a galvanometer at a distance, the temperature of the furnace can be read off the scale, or, as has been done in the new instrument, recorded on a band of photographic paper by a beam of light reflected from the needle of the galvanometer. Prof. Roberts-Austen employs platinum for one metal and an alloy of platinum, with 10 per cent of sodium, for the other. With this combination he can measure temperature up to the melting point of platinum.

THE GREEN RAY.—C. Mostyn, in a letter to Nature on the well-known appearance of the green ray at sunrise or sunset, caused by the refraction of air, states: "This 'green ray' is seen to best advantage at sunrises, owing, I imagine, to the eye not being wearied with watching the previous glare, as is apt to be the case at sunset. At the same time, I had many very satisfactory observations at sunset, one in particular, when we were running before a very heavy sea in the Southern ocean, and the green ray was seen no less than three times in as many seconds, as the ship rose and fell on the huge waves, causing as it were two sunsets, with a sunrise between them. The heat displays took place when the refraction near the horizon was of such a character that the sun assumed a halo or vase shape, as it came close to the sea line. When, on the contrary, the sun appeared flattened out in its horizontal diameter, the green ray was either entirely absent, or was seen only in an indistinct and uncertain manner."

EARS IN THEIR LEGS.—Science and the microscope sometimes make most unexpected revelations. Who that has heard the chirping of a cricket or the ear-splitting noise made by a tiny cicada and noticed the instant cessation of sound on the near approach of any moving body, can have any doubt but that such insects have ears whereby they may enjoy their

own music or detect the approach of danger? Yet for years naturalists were unable to detect any organ of hearing in their anatomy. True, a bright oval spot was noticed upon the fore-legs of crickets and a similar spot on the tibia of grasshoppers, but until Sir John Lubbock and other modern naturalists made a close study of the matter by aid of improved microscopes no one suspected that those little spots consisted of anything like an organ of hearing, especially as they were in such an out-of-the-way place for such an organ. But science is what and when we find it, and it has proven that crickets, bees, ants and most others, even of the most tiny specimens of the insect family, have ears and other sense-organs as well. The most hidden secrets of nature are fast being discovered and laid open to the world by the astute and plodding scientists.

ELECTRICITY DIRECTLY FROM HEAT.—The great desideratum of converting heat directly into electricity, or obtaining electricity from coal without the introduction of steam, will no doubt soon be reached. The solution of that problem is the philosopher's stone which just now all are seeking, and great will be the rejoicing when it is reached. Its discovery will work the greatest revolution in human industry which the world has yet met with. Every little advance in that direction is watched with the most intense interest. The conversion of the thermic energy combustion direct into electrical energy is already an accomplished fact, and recent investigations in that direction give some reason to believe that may be the path which will lead to success. The recent experiments of Dr. Girard, in France, in regard to such transformation seems to indicate quite a step in advance, as it is said they have already resulted in the construction of a stove, which may possibly, when perfected, effect a complete revolution in our present mode of heating dwellings and railroad cars.

UTILIZATION OF WASTE PRODUCTS.—The strides that are being made in the utilization of waste products, remarks the *Pall Mall Gazette*, gives hopes that soon the term, waste, will become a misnomer. The latest that we have heard of in this direction is the collection and utilization of the carbonic acid gas given off at breweries and distilleries during the process of fermentation. The quantities that are developed and at present allowed to run to waste are enormous, one estimate putting the annual production in the United Kingdom at 300,000 tons. It is at the same time a product of considerable value, and is extensively used in the manufacture of aerated waters, ice and other articles. By the process which has been patented the gas is collected, purified, liquefied and stored in iron bottles for commercial use at a very small cost. It has been in successful operation for some time in a large distillery in Dublin.

SUSPENDED MATTER IN FLAME.—The presence of suspended matter in flame, says *Invention*, has just been demonstrated by Professor Stokes. The way this is optically proved is to condense sunlight on the flame. The light is then scattered by the solid particles in an extremely thin layer, both where the beam enters the flame and where it leaves it. It is polarized in the flame of reflection; yet this effect is not found in all flames. It is absent, for instance, in that of a Bunsen flame lit with burning sodium. In the latter case, this seems to be due to the fact that the sodium is in the form of vapor—not of solid particles.

ROOTS OF A PLANT AS A FORCE PUMP.—The remarkable power exerted by the roots of a plant in forcing liquid up the stem was demonstrated in an interesting manner with apparatus at a recent meeting of the Royal Society in London. A stem about five-eighths of an inch in diameter was cut off at a height of four or five inches and joined by rubber connections to a fine glass tube about ten feet high. Early in the day this tube was filled to a height of a few inches with a colored liquid, but by evening the fluid had been forced to a height of about nine feet.

A GREAT MINING TUNNEL.—A gigantic tunnel, which is estimated to cost \$750,000 and require ten years to finish, is being constructed in the Leadville mining district, for the purpose of draining the mines. It will be at least five miles long, and will, when completed, leave to easy access millions of tons of good ore that cannot now be gotten at and probably never can be handled without the use of proper drainage.

POWER OF SMALL MAGNETS.—Sir Isaac Newton is said to have carried in his ring a magnet weighing but three grains, which could raise 746 grains or 250 times its own weight. This magnet naturally excited much admiration, but is surpassed in power by that formerly belonging to Sir John Leslie, and now in the Physical Collection at Edinburgh, weighing 3½ grains, and having a carrying power of 1560 grains.

THE LUMINOSITY OF ARC LAMPS.—Prof. Elton Thomson corrects the popular impression that luminosity of arc lamps is due to heated carbon particles. He says that, although there is a steady stream of carbon vapor between the carbons, yet the light is nearly all derived from the enormously heated surfaces from which the evaporation takes place.

ELECTRICITY.

A NEW TELEPHONE.—Something of an excitement has been created during the past three weeks in regard to the announcement of the invention of a telephone entirely novel in character, and for which wonderful advantages are claimed. The inventor is James A. Christy, a citizen of California, and his hanker is said to be E. J. Baldwin of this city. With them, according to reports, are associated such eminent capitalists as Jay Gould, John W. Mackay and J. B. Haggin. It is claimed that Mr. Christy has been several years at work upon the invention, which is so sensitive that the faintest whisper or the slightest rustle of wind can be transmitted thousands of miles. The patents for this wonderful instrument are practically all secured, and the work of manufacture and putting to use will soon begin. Baldwin is ready with his millions to put the inventor on the pinnacle of fame. In regard to the expense and mode of using this new instrument, Mr. Christy says the customer will simply have to drop a nickel in a box a foot square attached to the wall, make his own connection with the person or office he desired to reach, and talk until he was tired. No central office would have to be run up, and there would be no trouble at the switchboard because some one else was in the way. It is this central switchboard, which Mr. Christy has also invented and patented, that helps to make this instrument so practical. It is claimed that the originality of the invention is of such a pronounced nature that there is no danger of litigation on account of infringement. It is to be hoped that the story may be nothing less than it is represented to be; but the public will have more confidence in it after all these claims are substantiated by their practical application.

AN ELECTRIC LOO for measuring the speed of vessels at sea has recently been invented, and is just now attracting much attention from nautical men. The logs heretofore in use are known to be very unreliable. They all have a tendency to rise as the speed is increased, until at last they jump from sea to sea, and do not register the speed made by the vessel. To overcome this defect has been the object of the invention herein alluded to. It has been thoroughly tested by cruises about Boston bay, and by a trip on the Old Dominion boat to Norfolk. The result of the last trip, says the *Boston Transcript*, was so satisfactory that the owners of the log were persuaded to seek authorities in Washington, and have a trial made on one of the Government vessels which would steam 20 knots or over. The log was carried to Washington, and was found to contain so many useful ideas that it was decided to order a trial of it on a vessel of high speed. Rear Admiral Walker has been directed to appoint a board of officers, and have either the *Venus* or the *Cushing* used for the purpose. It is presumed that the *Venus* is to be the vessel selected for the trial, and that it was for this reason she was sent to the Brooklyn Navy Yard to be docked and cleaned for her work.

A NOVEL FORM OF ELECTRIC BELL, in which the vibrations are maintained, not by hammering, but by means of synchronically intermittent electro-magnetic attractions, has been invented. The bell or gong itself, which is made of steel, carries upon its outer edge a very small plate of platinum; and this plate, when the apparatus is at rest, just touches another platinum contact, which is attached to a fixed spring. Within the bell, and almost touching its edge, is a short, fixed electro-magnet, and this is put into electrical circuit with the platinum contact pieces. When the current is passed, the steel bell will be successfully attracted and released with great rapidity. The amplitude of its vibrations depends upon the strength of the current and upon the adjustment of the spring contact. By means of this device the disagreeable clashing of the ordinary electric hammer is replaced by a pure musical note. When the bell is mounted in a resonant box, it can be heard distinctly from a long distance.

AN ELECTRICAL REGULATING SWITCH, by which the consumption of electricity can be regulated at will, is one of the recent and most useful electrical inventions. By means of this device, a 16 candle power lamp can be so regulated as to produce a light all the way from 16 to one-half candle power. The fact that the size of the light and the consumption of electricity could not be controlled without changing lamps, and the consequent greater expense than perhaps was necessary at all times, has kept many from introducing electricity into their houses. A device of a similar character, if not the very same, will be applied to regulate the consumption of electricity according to the actual needs on the electrical road now in course of construction in this city. A device of this kind is just what is needed to render the use of electricity of more general and economic use.

AN ELECTRICAL APPARATUS FOR THE TREATMENT OF DEAFNESS.—An electrical apparatus for the treatment of deafness has been invented by George F. Webb of Jefferson, Ohio. It comprises a battery, a belt, an electrode supported upon the belt, and shaped to rest upon the ear, and having an opening on one side to receive the ear, and connections between the electrode and the battery. An efficient and

simple device is thus provided for constant use to remove the source of deafness, one which may be safely applied, and is designed, while serving as a remedy, to enable the patient to hear distinctly.

AN ELECTRICAL STOP WATCH, which will register hundredths of a second, has been invented which is said to have been already most satisfactorily tested. At a recent trial, it determined which was ahead on the trial of two bicycles in which the winner won the prize by only a one-hundredth part of a second. One machine ran a hundred yards in 10.4-100 of a second; the other in 10.3-100. In a 220-yard contest the same two machines made such the run in exactly 23.97-100 seconds. The human mind is utterly unable to time so closely. A man holding a watch must observe the starter's pistol, press the button, and at the finish, watch for the supreme moment and record the time without anticipating or delaying the instant at the finish.

AN ELECTRICAL MUSICAL INSTRUMENT has been devised by a Frenchman. He calls it a "palliphone." It is made up of a series of bells of different tones. Each bell is placed between an electro-magnet and an interrupter, and the bell itself thus becomes the medium of the electric current. The sounds produced are said to resemble those of an organ.

AN ELECTRIC LIGHT FOR A CANE has been devised for the use of physicians, reporters and others at night. The light is supplied by a small storage battery in the head of the cane. It will be found convenient for seeing the door number and for many other purposes for which a lantern would otherwise be needed.

Pacific Coast Electric News.

The power houses of the North Beach & Mission electric road of this city will be situated on the southwest corner of Fourth and Louisa streets, the site of the company's present stables, and a large carhouse will be erected on a block of land owned by the company at Folson and Twenty-eighth streets. Construction will soon be commenced on Folson street, at California avenue. The money for the construction of this road will be raised by the issue of \$1,000,000 worth of bonds. The line will run by the present route from the ferry to Precita avenue.

San Francisco capitalists have in contemplation the construction of an electric road from the tide-water landing at Napa to Calistoga, a distance of 28 miles. It is proposed to commence the construction of this road early in the spring if the proper preliminaries can be completed by that time. The road will be used for freight as well as for passenger service, and it is expected to start one or more cars every hour during the business portion of the day. Passenger fare will be one cent per mile, and freight at a material reduction from present rates. So says the *Napa Exchange*.

Electrical Railroad Through the San Gabriel Valley.

The *Ontario Observer* predicts that an electric railroad will soon be constructed along the foothills on the north side of the San Gabriel valley, from Los Angeles to San Bernardino. Such a road, it is claimed, could be operated for one-half the cost of operating either of the two steam railroads now running through that valley, for the reason that all the electrical power needed could be obtained from water now running to waste at different points along the proposed route. For economic transportation of passengers and freight, the electric system, when furnished with cheap water power, has no competitor, and with such inexpensive power at its command, the road proposed could, at one half the rates now obtaining, earn its stockholders greater dividends than are being earned by the two steam railroads now running between Los Angeles and San Bernardino.

Electrical Railroad Possibilities.

The possibilities of railroad transportation along all the foothill regions from Shasta to San Diego are beyond computation. The cheapest water power might be utilized throughout that whole distance—a power which, under such conditions, might bid defiance to any competition from steam. The cost of construction of such roads would also be far less than the cost for steam roads, which have to sustain the concentrated weight and hammering of the high locomotives inseparable from the operation of steam roads. The 2500 miles of electric railroad now in operation in this country and Europe have all been built since 1885. The construction and operation of such roads, for through business of all kinds, has now fully passed the experimental stage, and such construction has but just begun. Who can predict the future, in view of the rapid improvements that are now being made in the way of generating, storing and transmitting electrical power?

THE WHATCOM ELECTRIC ROAD.—The people of Whatcom (Washington) are looking forward to the completion of the Lake Whatcom electric road, which it is expected will be running about the first of January. The Thomson-Houston electric system will be used. The power will be supplied by two steam engines of 150-horse power each.

The weight of the average lead-storage battery is about 100 pounds per horse-power hour.

A battery to run six hours should be charged 10 or 12 hours. Under the most favorable conditions, says *Practical Electricity*, 80 per cent of the current used in charging can be recovered in its performance.

The first electric road in Brazil will be built at Bahia, where a narrow road $1\frac{1}{2}$ miles in length is under construction.

ENGINEERING NOTES.

CANADA'S WATERWAYS.—The Dominion Government is spending many millions of money in enlarging and improving its facilities for transmitting shipping around the obstruction between the Great lakes and on the St. Lawrence river. This enlargement has already reached the enormous sum of \$26,000,000, in addition to the original cost, \$15,000,000. It is furthermore estimated that about \$15,000,000 more will be required to finish the work now in progress. When these improvements are completed, the largest commercial vessels will have free passage from the mouth of the St. Lawrence into Lake Superior. Of course no one believes that all this money is being expended for commercial purposes alone. These improvements are all on British soil, and fortifications are already beginning to appear at strategic points along the route. By our treaties with Great Britain, no war vessels are allowed in the lakes under either flag; but England is preparing the way whereby they may be placed there in a few days after any war might break out. All this time the United States is quietly looking on and doing nothing. Is it good policy? We have a ready access to Lake Michigan, which might be made available for both war and commercial purposes by expending only a limited amount of money on a natural waterway from the Mississippi to the lake. An addition to that amount, far less than that being spent by Great Britain, would make full connection with all the lakes entirely upon our own soil. Such improvements would be worth far more than their cost for commercial purposes alone. An agitation in that direction should be set on foot by the people, in order to force action by Congress.

THE ROMANS AS ENGINEERS.—The Romans were the first great engineers, and in their own particular manner have never been excelled. Their genius was more of an engineering quality than architectural, and it is in this department they erected their most successful structures. Architecturally, though of wonderful variety and imposing magnitude, Roman art was rich, too great a combination of diverse elements to be thoroughly artistic and in keeping with refined taste. The barbaric Etruscan element in the Roman character which found visible expression in their gladiatorial and bloody shows, was too strongly rooted to be eradicated even in the centuries of independent Roman existence. The many lands which Roman conquerors placed under their city's sway made them familiar with a great variety of architectural forms they did not hesitate to avail themselves of, and the result was a combination, wonderfully rich and impressive, but often violating the canons of architectural art. Measured by the faultless standard of the Greek, its immediate predecessor and the model it most closely followed, Roman art leaves much to be desired from the æsthetic standpoint. But however unsatisfactory the Romans were in architectural design, and it must not be forgotten that after all it is the parlor which chiefly finds fault with them, they more than made up, as constructive builders. Construction was the Romans' chief point of excellence, and they brought to this work a native genius and an insight into engineering requirements of a very high order. —*Engineering Magazine*.

THE POWER LOST IN A JACKSCREW is immense when set up in haste, without any regard as to how the strain may come. It is necessary that there should be 50 per cent in friction to keep a jackscrew from running backwards, and the pitch of the screw is generally such that the jack will remain wherever it may be turned; but when blocked up under one edge, instead of having a bearing on all sides it takes nearly as much to turn the screw one way as the other, and if the oap piece has not been dished out on a true circle what little power that remains may be taken up from this source; and no wonder that the hydraulic machines take the lead where nearly every ounce of force is made use of.

THE PRINCE EDWARD ISLAND TUNNEL.—The Canadian Government has had under consideration for a long time the construction of a tunnel under the Straits of Northumberland, which will connect Prince Edward Island and New Brunswick. A report recently made to the government shows that the work is feasible, and that the cost for a tunnel that will accommodate all kinds of cars will not exceed \$12,000,000. The distance from shore to shore is about 13,500 yards, and the whole tunnelling required, including the approaches, would be about nine miles.

INCREASING USE OF PETROLEUM FOR FUEL.—The use of crude petroleum for fuel is constantly extending. It is said that 15,000 barrels, equal to 40,000 tons of coal, are consumed daily in Chicago. It is now used in 18 States.

GOOD HEALTH.

INTOXICATION FROM SUGAR FUMES.—It is mentioned as a very curious fact that the gases arising from sugar that has been stored in the hold of a vessel without ventilation will produce a state of intoxication. This saccharine "jag" is caused by merely breathing the air where the sugar has been stored, and while 20 minutes in the open air is sufficient to work off its effects, it is none the less a "jag." While the barkentine John Swan was unloading a cargo of sugar at Pier 30, in Philadelphia, says the *Record* of that city, it was noticed that quite a number of the stevedores, working in the hold of the vessel, were acting in a strange manner, as though under the influence of liquor. They were induced to go on deck, apparently in a healthy state of intoxication, but after a few minutes in the open air they recovered and continued their work. John Daffy, one of the men affected, pronounced the sensation to be exactly similar to effects produced by drinking whiskey. For a while he felt stimulated, then began to grow exultant and hilarious. Shortly after that he began to get dizzy and stagger, and finally lost all control of his mental and physical faculties, when he was removed to the open air, and recovered shortly afterward. The effects of the fumes have only been noticed early in the mornings, when the hatches are first removed. Gradually the current of air from the two hatches dissipates the gas, and within an hour it disappears entirely, leaving only a disagreeable and penetrating odor and a sediment which penetrates every part of the vessel.

HEALTH OF THE STATE.—The State Board of Health report for September contains mortality reports from 63 cities, towns, villages and localities, having an aggregate population of 675,551, show the total number of deaths from all causes in September to have been 929, making a death rate per thousand of 16.44 per annum. Consumption was the cause of death in 129 cases, pneumonia in 38, bronchitis in 13, congestion of the lungs in 3, diarrhoea and dysentery in 30, cholera infantum in 30, other diseases of the stomach and bowels, 63, diphtheria, 33, membranous croup 10, whooping cough 6, typhoid fever 20, malarial fevers 7, cerebro-spinal fever 3, cancer 20, erysipelas 3, heart diseases 73, alcoholism 8, and from all other causes 444. The prevailing diseases, as reported from 55 localities, give 30 cases of cholera infantum, 168 of diarrhoea, 47 cholera morbus; 41 dysentery, 29 measles, 26 diphtheria, 31 whooping cough, 39 typhoid fever, 379 malarial fevers, 62 bronchitis, 42 influenza, 5 rheumatism, and 62 other diseases.

TARTAR ON THE TEETH.—Dentists have discovered that tartar, a calcareous deposit on the teeth, is more abundant in persons of highly nervous temperament than in any others. The explanation, according to an observant dentist, is that persons of nervous temperament secrete more saliva than others, and as tartar is carried by saliva in solution, the deposit in the case of such persons is unusually large. It is a well-known fact that the nervous condition has a marked effect upon the salivary gland. An Oriental method of detecting crime is to take several persons suspected of offense and require them to chew dry wheat. The nervous fears of the guilty man seals up his salivary glands and he chokes in attempting to reduce the grain to pulp.

GAMY MEATS NOT HEALTHFUL.—There are many people who prefer "Gamy" meats, or, in other words, meats that are a little over the line of decomposition; nor are they ready to accept the fact, long ago established, that such meats are not only unfit food, but are in a high degree harmful. When decomposition occurs, poisons are developed. Healthy adults are able to resist these poisons to a trifling extent. Just where this resistance lies no one knows, but it is generally accepted that it is in the liver. This theory is supported by the fact that those who are inclined to be bilious and have sluggish and otherwise deranged livers are always upset, if not made really ill, by meats or fish that have become in the slightest degree tainted.

IT IS THE LITTLE THINGS OF LIFE that tax one's nerves the most, as a stalwart youth of Kansas found when he accepted a wager that he could not stand a quart of water dropped into his open hand drop by drop from a height of three feet. Before 500 drops had fallen into his hand he almost cried with pain and said he had enough. After a little water had fallen, each drop seemed to crush his hand, and a blister in the center of it was the result.

ELECTRICITY AS A CURE FOR TIPPING.—An exchange says that fashionable men in Paris and London are now using electricity as a cure for excessive tipping.

THE CAPE COD CANAL has got another setback. A Canadian syndicate recently proposed to undertake its construction; but have lost their right on failing to make a deposit of \$500,000 before Sept. 9th, to secure their charter. Report has it that the old original company will once more resume its construction; but to do so, this company will be obliged to make a deposit of \$100,000 on or before November 1st. It is greatly to be regretted that failure to secure capital should keep back the construction of this important work.



A. T. DEWEY.

W. B. EWER.

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SAN FRANCISCO:

Saturday, October 17, 1891.

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Passing Events.

The opening of the belt line railroad along our city front this week marks an era of great progress. Ship and car are brought together, and goods may be landed close to the warehouse without any long-distance teaming as formerly. In time the belt road will be extended completely along the city front.

Grass Valley expects before very long to have electricity furnished it for power, the original source being in the South Yuba river. Many mines which cannot get water-power, owing to their location, could be supplied with electrical power for their machinery.

The formation of a Traffic Association by the merchants and shippers of San Francisco has been accomplished, and much good to our commercial interests is expected to result. The committee is now at work on the details of the plan.

In the death of Joshua Hendy this week, San Francisco loses not only a pioneer foundryman, but one who was a pioneer in introducing and manufacturing several important mining appliances now in very general use.

Will no Longer Contest the Issue on the Old Lines.

The controversy between the enjoined hydraulic miners and their opponents has been a long and bitter one, having for a period of 15 years been carried on with much acrimony on both sides. When, at last, a commission was appointed to effect, if possible, an adjustment of the differences between these parties, each affected to be pleased with the arrangement, professing a willingness to abide by the finding of such commission, whatever it might be.

And now that the members of this commission, consisting of three officers chosen from the Engineering Corps of the U. S. Army, have completed their task and made their report, it must, in justice to the parties to this contention, be admitted that, as a general thing, they have expressed themselves satisfied with the conclusions reached by the commission; and yet, owing to certain events that have intervened, these conclusions are likely to prove nugatory and of no effect.

Anticipating the finding of the commission, which was to the effect that the miners might, in most cases, be safely permitted to resume work after having built suitable dams for impounding the mining debris, the Liberty Hill Hydraulic Mining Company had proceeded to build on Bear river a structure of this kind, in the expectation that they would not afterward be molested. But in this they were disappointed, having been enjoined soon after they recommenced gravel washing, the reason assigned by the court for such procedure being that the dam so erected was not only insufficient for the purpose intended, but that it was dangerous as well, being liable to give way and destroy the lives and property of persons living along the river below.

As this dam had been built with care and after the style most approved by competent engineers, the enjoined miners have come to the conclusion that they cannot safely incur the expense of building dams of this kind preliminary to resuming work on their claims so long as they are exposed to the liability of being enjoined by these local courts. Until such time as they can have the question of the sufficiency and safety of these structures determined by some more competent authority they have about made up their minds to let matters rest as they are. It may, in this connection, be proper to observe that the Bear river dam above mentioned, has not only well answered the purpose for which it was intended, having caught and retained all the debris coming down that stream, but it has withstood without the slightest impairment the winter floods occurring since its construction, some of these floods having been of unusual severity. It is argued by the miners, therefore, that it would be very unwise for them to erect any more of these retaining dams with such precedent before them.

Unless, then, some plan can be devised, whereby these men can be insured more adequate protection against this class of judicial proceedings the findings of this Commission, so largely acceptable to a majority of both the farmers and the miners, will prove of little avail, if not wholly futile and inoperative. That Congress, cooperating perhaps with our State Legislature, will be able to devise some such plan may reasonably be expected. Only through legislation can anything further be done, matters, so far as the miners are concerned, having come to a dead halt. They do not contemplate farther movements, either offensive or defensive. Their association has been disbanded, they have no common fund, and all concerted action has come to an end; and, at least, we are credibly informed is the case. Nor under the circumstances, can we see what additional step these miners can take.

They cannot resume gravel washing without taking care of their tailings, a thing impracticable without the construction of costly dams, and these they do not feel that they can afford to build with so little chance of their being approved by the powers that be. The alternative of giving up the business is a desperate one, too much so to be adopted by any but a thoroughly venturesome man.

While the public knows something of the long warfare waged between the hydraulic miners and the farmers, it knows little of the many make-shifts to which the former have resorted in the hope of being able to realize some small

earnings without injuring any other interest or calling. To accomplish this end, they have built retaining dams, with the result stated. They have had recourse to the hydraulic elevator, depositing their tellings in the old gravel pits, and also to the drift process, neither of which having been attended with much success they are now about to try the experiment of giving up work altogether, or at least suspending it till such time as it can be carried on without being constantly interrupted by legal proceedings. Until the business can be placed on some such basis it is not probable that any of the larger hydraulic companies will ever again run or attempt to run a giant in their mines. Certain it is they will not longer undertake to fight this issue on the old lines.

There is one thing certain, the gold that used to come from these mines is very badly misused in this State; and while, during the height of the debris controversy, when bitter partisans were advocating their respective sides, the general feeling was against the miners, and in the end they were defeated, now there is a change apparent. People are more lenient and less prejudiced than they were. They would like to see some means adopted by which the miners could work, provided they did no injury to others with their debris. The first public indication of this was in the message of the present Governor of the State, in which the mining interest was favorably spoken of and the suggestion made that the Legislature ask Congress to supply some remedy to the existing conditions. More recently, the Sacramento Supervisors visited the Iowa Hill mines and had a conference with the miners relative to permitting them to do certain work; and only last week at the session of the Bankers' Association, in this city, the president suggested it was a question of the first importance as to how to increase the gold output of the State without injuring any citizen's property.

There is doubtless the same opposition to the miners injuring the rivers and harbors that there always was; but there is also a feeling that the dams should be given a thorough trial, and if they fail to hold back the debris, the engineering profession should be called upon to solve the problem, so that the mines can be worked. A few fanatics there are, of course, who can see no way to let the miners work, and want to see no way. But the great mass of the people are tired of the controversial feature and would like to see the problem left in the hands of professional engineers, in the hope that a method may be devised by which the mines can be worked without injury to rivers or lands.

What might now be done would be for the General Government to build a number of the dams, their sites to be selected and their construction supervised by an agent of the Government. Should these dams answer the purpose intended, then the miners might be required to go on and erect such additional number thereof as seemed necessary, the Government agent designating their localities and also looking after their construction. With an arrangement of this kind the miners would be satisfied and this vexatious question be permanently disposed of, to the relief of the general public as well as of the parties more directly interested in its settlement.

A MINING CONGRESS.—The object of the National Mining Congress, to meet at Denver, Colo., November 18th, 19th and 20th, is to organize and adopt measures to regulate the production and distribution of the mining product of the United States. The affair is in charge of an Executive Committee consisting of Chas. E. Taylor, D. H. Moffat, N. P. Hill, H. A. W. Tabor, Dennis Sheedy and M. J. McNamara. Secretary Caretaphen states that the appointment adopted by the Executive Committee gives each State ten delegates, to be appointed by the Governor, each town one at large, one for the first 2500 population, and one for each additional 10,000 population, one for each mining stock exchange, and one for each ten members thereof. The Executive Committee will appoint 50 delegates for the country at large. The Congress is to be held at the Denver Mining Exchange.

The works at Keeler, Inyo county, are turning out two or three carloads of soda daily. It is rumored that an English company has purchased the works and locations.

The Late Joshua Hendy.

Joshua Hendy, manager of the Joshua Hendy Machine Works, died in this city on Wednesday, in his 74th year. Mr. Hendy was well known to the mining community all over this coast as a manufacturer of ore-feeders, concentrators, hydraulic nozzles and hydraulic elevators.

Mr. Hendy came to the United States from England in 1836, and lived for a long time in Louisiana and Texas. He arrived in California on the steamship Oregon Sept. 19, 1849. He first went to work in an open-air boiler shop, where Leideedoff street now is. By chance he learned that three portable saw-mills were to be sold, and these he bought and placed in operation in different parts of the State. He took one himself to Sonoma county, where he joined forces with the Duncan Bros. and started what eventually became Duncan's Mills. He then went to Placer county in the sawmill business. After some time he returned to San Francisco, where he commenced to manufacture sawmill machinery, a specialty he conducted up to the time of his death.

In addition to sawmill work at his shop, he began to manufacture automatic ore-feeders. It was at first up-bill work introducing these machines into the quartz-mills, but he persisted and the opposition was finally conquered. He bought up several patents and soon had practical control of the ore-feeder business, and has kept it ever since. He made the Triumph, Stanford, Improved, Hendy Challenge and others. This branch of his business was very profitable indeed.

In ore concentrators he was also a pioneer, and some thousands of the Hendy ore concentrators were put in use until the belt machines supplanted the original form. Then he became owner of the Triumph concentrator, a form of belt machine of which many have been sold.

He was also sole manufacturer, under letters patent, of the hydraulic giant known as the Fisher double-jointed.

He was the first one to manufacture the hydraulic gravel elevators, now so largely used. The mining engineers did not believe these machines were practical, but Mr. Hendy did. They have been found to accomplish the purpose of raising earth, sand, gravel, etc., from shallow deposits, and working low ground where there was no "fall." To prove their value, Mr. Hendy bought the Yreka Creek gold mining property, in Siskiyou county, built an elevator and put it at work. This venture is said to have cost him some \$70,000, because the ground did not pay. The machine, however, was a success, and he has since continued to make and send them all over the world.

In September, 1882, Mr. Hendy formed his business into a corporation designated the Joshua Hendy Machine Works, of which he was manager, and his nephew, Samuel J. Hendy, is president. The scope and extent of the business has been largely increased, and while continuing to deal, perhaps on a greater scale, in second-hand machinery, they have extended their facilities for manufacturing new, of any required form or design, and to furnish any character of plant for any mechanical requirements.

The works are agents for a number of things, engines, boilers, pumps, blowers, tools, etc. They also built quartz-mills and equipped gravel claims with gold-saving appliances.

Mr. Hendy has not taken so active a part in business in the past few years as formerly. He was a very energetic man, pushing and persistent. In connection with the ore-feeder business, and that of the hydraulic elevators and concentrators, he had many a controversy and hard-fought battle. He was a peculiar man in many ways, and a successful one. He was among the pioneers of the foundrymen of this city and State, and built up a good and steady business in many branches.

THE GILMAN STRIKE.—A Seattle dispatch of the 19th says: The strike in the Gilman coal mines, which was inaugurated last March, was declared off yesterday at a meeting of the strikers. The company has announced that all the men who gave satisfaction before the strike will be taken back. The agitators, however, will be barred.

YREKA, Siskiyou county, is now lighted by electricity.

The Con. California and Virginia.

The famous bonanza mining company—the Con. California and Virginia—held its annual meeting on Monday.

Supt. Lyman's report is a lengthy document. The main points of interest in the mine during the past year were the 1100, 1500, 1750 and 1800 levels.

A summary of the superintendent's statement of the bullion extraction during the year shows that in all 86,443½ tons of ore were worked at the Morgan and Eureka mills. The total value of the bullion produced was \$1,752,776.03, of which \$929,922.34 was in gold and \$822,853.69 in silver. The average yield of bullion per ton was \$20.23, of which \$9.58 was in gold and \$10.65 in silver. The total assay value of the ore per ton was \$26.04.

The secretary's financial statement showed a cash balance on hand of \$98,000.

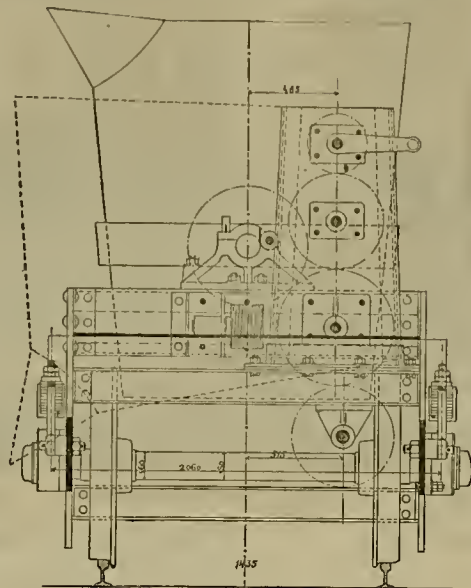
Operations in the mine from the 1500 level upward are carried on through the Con. Virginia shaft, and all operations from the 1600 downward carried on through the C. & C. shaft. Both shafts and the machinery connected therewith are in good working condition.

The gross product of the mine for the past fiscal year was valued at \$1,752,776.03. After paying two dividends of 50 cents each, the total of which was \$216,000, and all the expenses of the year, the company has a cash balance on hand of \$98,000.

The old directors were unanimously re-elected, consisting of C. H. Fish, H. B. Havens, W.

The Belt Line Railroad.

The belt line railroad on the sea-wall of the harbor front began operations this week, and the first trains were brought to the freight-sheds. Only a portion of the entire system is complete, and that on the northern sections of the sea-wall. The belt line extends along the



Pacific, have been built on lots bounded by Front, Davis, Vallejo and Green streets, while a big coal platform stands along Davis street, extending from Vallejo to Broadway.

An immense train of heavily loaded freight-cars was shunted on to the new track from the steamer Ukiab, the locomotive "Governor Markham" doing the work, and the cars were moved over the entire line of road-bed.

The belt line is under the control of the Harbor Commission, and the road may be used by any one by securing a side-track for his private use, to stand cars upon while loading and unloading.

The object of the system is to afford manufacturers and shippers easy and rapid facilities for direct connection by rail and ferry with the railroads centering across the bay. It will no longer be necessary to use teams for freight from the extreme southern end of the city, where the railroad depot is. The cars are brought in the ferry-boat, and the freight can be discharged near the large warehouses of the city.

AN ORE-FINDER.—A Denver, Colo., dispatch to the St. Louis Republic says: There is another craze in Colorado over a patent a man claims to have by which

from Los Gatos to Oakland will be 85 cents. The present rate is \$1.60.

The Triplex Electric Pump.

(Continued from page 261.)

The combination which has met with such success in the applications mentioned above and which is handled by the Thompson-Houston Motor Company for ordinary pumping work, and specially fitted for mining work by the Thomson-Van Duzee Electric Mining Co. for all mining, excavating and metallurgical operations. Information on the subject of the applications of these pumping outfits, together with efficiencies and prices, will be furnished by the above companies upon request.

A New Excavator and Levee Builder.

An engraving on page 261 shows an automatic excavator and levee building machine invented by J. H. L. Took of this city.

This machine is adapted to both dry and wet work. When required for dry work it is mounted on a portable railroad track. The machine moves automatically along the rails by means of a rack and pinion, the speed being easily adjusted by the engineer. For wet work, the machine is placed on a flat boat.

One of the peculiar features of this machine is the series of small double mouldboard plows attached to the alternate links of the bucket chain. These plows cut from one-half to one inch deep into the bank, thus loosening a sufficient amount of material to fill the following bucket. By this means the buckets are left to act only as conveyors of the material. This reduces the power required very greatly, and the wear of machinery is much less than by the old plan of excavating by the buckets themselves.

The swinging boom rests on friction rolls that receive both the lateral and vertical weight of the boom, buckets and plows, thus reducing the strain on the main shaft to a minimum.

There is a reciprocating joint on which the drum carrying the boom and excavating machinery is located. This allows the boom to swing to any angle without changing its relative position to the driving shaft.

The novel arrangement enables one man to run the entire machine, cutting a ditch from three feet to 20 feet in width, and to any depth down to 20 feet. A medium-sized machine is capable of excavating from 2000 to 4000 cubic yards every 24 hours. The largest size has a capacity of 10,000 yards in 24 hours.

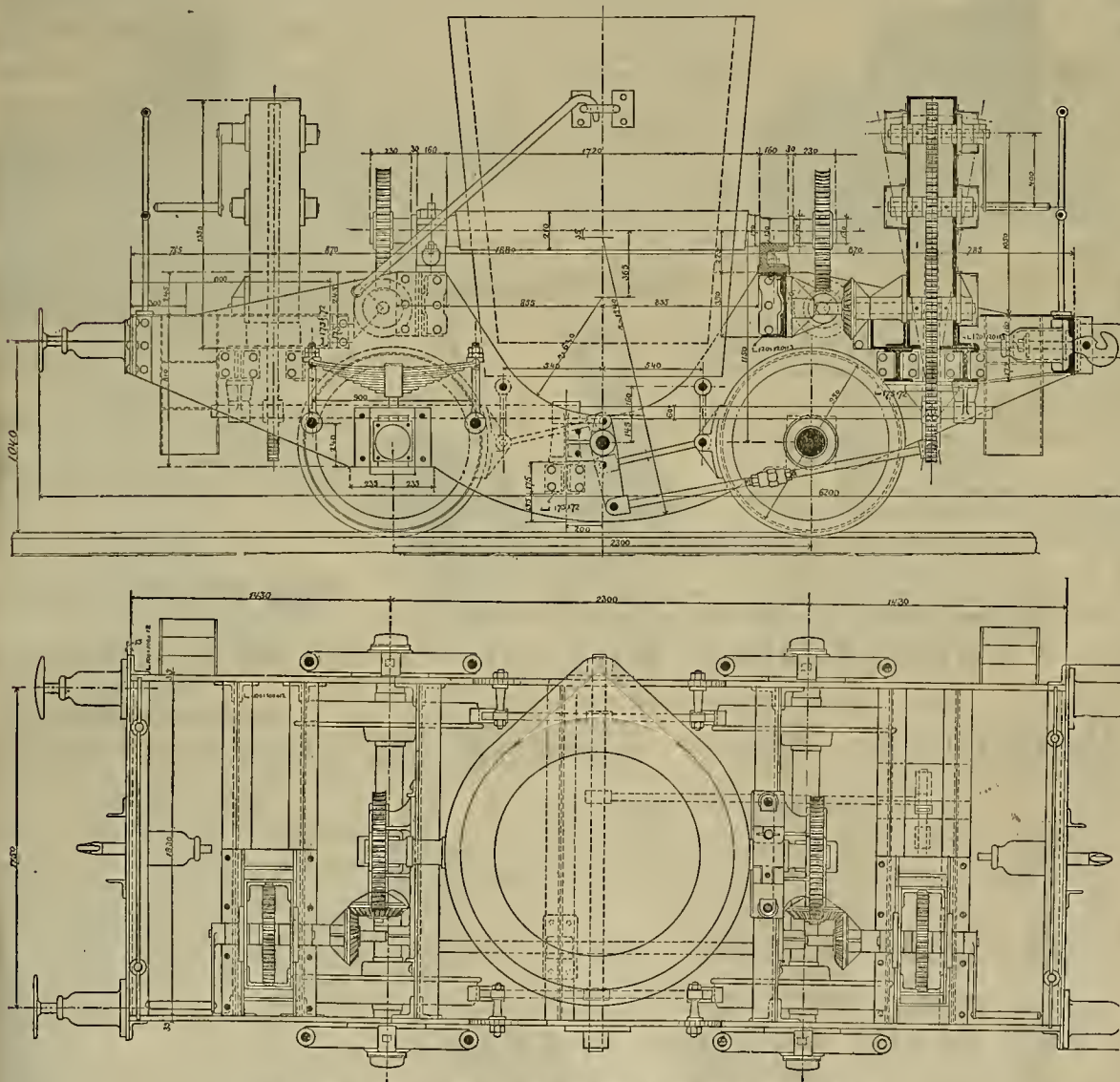
The bottoms of the buckets open automatically to discharge the contents into the conveyor, which deposits the material when wanted. As soon as the bucket is discharged the bottom closes and locks. The machine is quite ingeniously constructed. The plow feature is a very important one, leaving the buckets only the work of removing the loosened earth.

A Reducing and Amalgamating Plant.

An engraving presented on page 261 shows a plant for reducing ore by a Dodge mill, such as was described and illustrated in the Press of Aug. 8th last. The Dodge pulverizer now comprises many improvements which are the result of experience in working gold ore. Parke & Lacy of this city, the manufacturers, are prepared to erect complete mills on this system on the general plan shown in the engraving. These mills are doing exceptionally good work in several places on this coast. They are made to work either wet or dry. In the complete plant, everything moves by gravitation, on the modern system of mill-building, as the engraving shows. In this plant, the pulverizing, amalgamating and concentrating are all accomplished.

A Tipping Ladle-Car.

At the Hoerde Works, Westphalia, on the basic-converter practice, the pig metal is weighed off in 10-ton charges. It is brought to the converter in a tipping ladle of the form shown in the accompanying cuts. Three converters are used in alternation. The bottoms have 72 cylindrical holes, 17 to 18 mm. in diameter. With a blast pressure of 30 pounds the duration of a blow is nine minutes before decarbonization, and five minutes after it. The ladle car is very heavy, as may be imagined from the load it has to carry. The cuts are self-explanatory as to construction.



TEN-TON LADLE-CAR AT THE HOERDE WORKS, WESTPHALIA.

S. Lyle, Geo. R. Wells and C. O'Connor. Chas. H. Fish was appointed Pres.; Geo. R. Wells, Vice Pres.; A. W. Havens, Sec.; D. B. Lyman, Supt.; and Nevada Bank, Treas.

The California Powder Works are preparing to manufacture a smokeless powder, and a small plant is now under way at Benicia. The smokeless powder which it is proposed to make will be from a formula similar to that used in the European manufactories.

water front from Broadway to Francisco street in a double track system, both narrow and broad gauge. There are, in addition, for switching facilities, ten side-tracks built into the sea-wall, from lots 10 to 14 inclusive. There is track enough at present to accommodate 150 cars, and within a short time it will be increased for 400 or 500 cars. Two freight-sheds, one for the broad-gauge trains of the Donahue system and the other for the narrow-gauge cars of the Santa Cruz Division of the Southern

rich portions of a vein of mineral can be at once discovered. Just what the machine is, nobody seems to know, but it is a small instrument that can heresidly carried in the hand.

ELECTRIC RAILWAY.—The Los Gatos Board of Trustees granted F. Chappellet and others a franchise to operate an electric railway through the town. This is part of Howard's San Jose and Los Gatos system. By it the rate of fare

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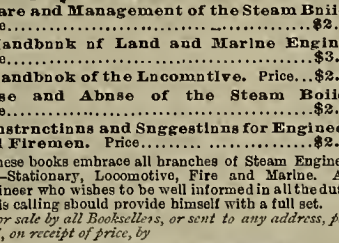
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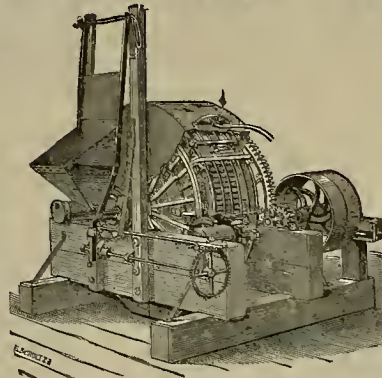
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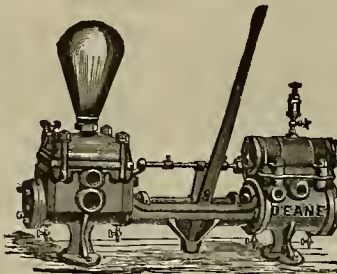
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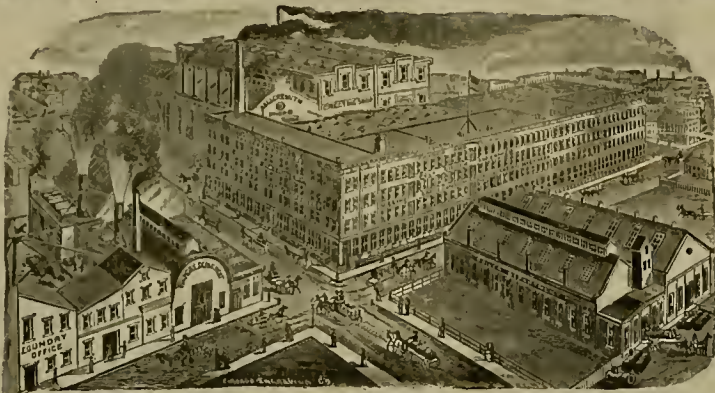
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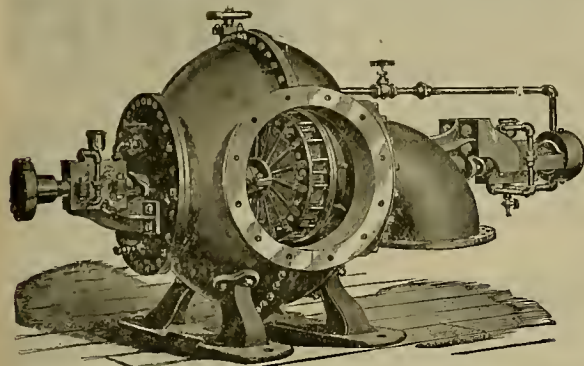
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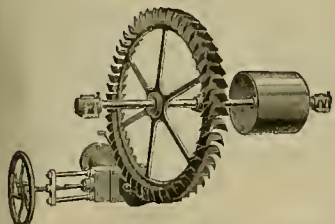
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Overman M. Co., Nevada.....	17.....	Aug 31, Oct 3, Oct 27.....	E Edwards, 314 California
Peerless M. Co., Arizona.....	17.....	Sept 17, Oct 19, Nov 19.....	A Waterman, 309 Montgomery
Sierra Nevada M. Co., Nevada.....	100.....	Oct 6, Nov 11, Dec 1.....	E S Parker, 309 Montgomery
Slackton Cons. Quicksilver M. Co., California.....	1.....	Oct 9, Nov 12, Dec 4.....	E F Stone, 308 Pine
Silver King M. Co., Arizona.....	7.....	Aug 18, Sept 23, Oct 27.....	J W Pew, 310 Pine
Union Cons. M. Co., Nevada.....	44.....	Aug 31, Oct 5, Oct 27.....	A Barstow, 303 California
Utah Cons. M. Co., Nevada.....	13.....	Oct 16, Nov 24, Dec 18.....	A H Fish, 358 Montgomery
Yellow Jacket M. Co., Nevada.....	49.....	Aug 31, Oct 2, Nov 7.....	W H Blauvelt, Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
Happy Valley Hydraulic M. Co., California.....	Annual.....	D M Kent, 330 Pine.....	Oct 24
Slackton Cons. Quicksilver M. Co.....	Annual.....	E F Stone, 308 Pine.....	Nov 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Champion M. Co.....	10.....	T Wetzel, 520 Sansome.....	Aug 15
Cons. Cal. & Virginia M. Co., Nevada.....	50.....	A W Havens, 309 Montgomery.....	Aug 17
Copie M. Co.....	25.....	A H Fish, 358 Montgomery.....	Sept 10
Great Western Quicksilver M. Co.....	25.....	A Halsey, 328 Montgomery.....	Oct 1
Idaho M. Co., Grass Valley.....	3 00.....	Grass Valley.....	Aug 4
Mayflower Gravel M. Co., California.....	50.....	D M Kent, 330 Pine.....	Aug 20
Peacock Coast Borax Co., California.....	1.....	D M Kent, 330 Pine.....	Aug 20
Standard Cons. M. Co., California.....	10.....	J W Pew, 310 Pine.....	Oct 26

San Francisco Metal and Coal Market.

THURSDAY, October 23, 1891.

ANTIMONY.	STEEL.
Per lb..... 14 @	English, lb..... 16 @ 20
BORAX.....	Canion tool..... 9 @ 10
Refined, in car lots 8 @	Bit's Diamond tool..... 9 @ 9
Powdered, do..... 8 @	Pick & Hammer..... 8 @ 10
Concentrated, do..... 7 @	Machinery..... 4 @ 5
All grades jobbed at advance.	Tool Oils..... 4 @ 5
COPPER.	TIN PLATE.
Bolt..... 22 @	B. V. steel grade.....
Sheathing..... 22 @	14x20, spot..... \$ 75 @
Ingot, jobbing..... 22 @	Charcoal, 14x20..... 6 @ 60
Do, wholesale..... 22 @	Do, roofing, 14x20..... 6 @ 60
Fire Box Sheet..... 22 @	Do, do, 20x28..... 13 @ 00
IRON.	Pig tin, spot, lb.....
Bar, base..... 3 @	Irregular, nom'l..... @ 21 1/2
Norway, base..... 4 @	COAL.
Pig iron.....	Spot, from yard—PER TON.....
Eglington..... 28 @	20x20, Wallington..... \$9 00
Glenbrook..... 27 @	20x20, Greta..... 3 00
Am. Soft, No. 1..... 28 @	30x30, Carbon Hill..... 3 00
Oregon Pig..... 25 @	30x30, Nainaimo..... 9 00
Fugot Sound..... 27 @	30x30, Gilman..... 7 50
Olay Lane White..... 23 @	24x24, Seattle..... 7 00
Shotts, No. 1..... 27 @	23x23, Coos Bay..... 6 00
Langdon..... 23 @	23x23, Channell..... 9 00
Thorncliffe..... 23 @	23x23, Hard..... 14 @ 00
Gartsherrie..... 23 @	23x23, Cumberland, in sacks..... 13 @ 00
Barrow..... 23 @	23x23, Do, bulk..... 13 @ 00
Cargone..... 23 @	23x23, Wall-end..... 9 00
CHROME IRON ORE.	Spot, Spint..... 8 00
Per ton..... 10 @	Bryno..... 8 50
LEAD.	West Hartley..... 8 00
Pig..... 4 @	TO LOAD—PER TON.....
Bar..... 5 @	Australian..... \$7 12 @
Spot..... 4 @	Liverpool Steam..... 7 @
Pipe..... 4 @	Scott's Spint..... 7 @
SHORT.	Ordnance..... 7 25 @
(Discount 10% on 600 bags.)	Lehigh Lump..... 13 @ 00
Drop, 3 @ bag..... 1 90 @	Cumberland..... 10 @ 00
Drop, 3 @ bag..... 1 90 @	Egg, hard..... @ 11 00
Obtained, do..... 2 30 @	West Hartley..... @ 11 00
QUICKSILVER.	COKE.
By the tank..... @ 45 00	English, to load..... \$9 00 @ 11 00
Flasks, old..... 40 @ 50	Do, spot, in bulk..... @ 12 00

Eastern Metal Markets.

By Telegraph.

New York, October 22.—The following are the closing prices the past week:	Silver in Silver	Copper.	Lead.	Tin.
Thursday..... 44 1/2	96 1/2	12 1/2	4 3/4	20 1/2
Friday..... 44 1/2	96 1/2	12 00	4 3/4	20 05
Saturday..... 44 1/2	96 1/2	12 00	4 3/4	20 05
Monday..... 44 1/2	96 1/2	12 1/2	4 3/4	20 10
Tuesday..... 44 1/2	96 1/2	12 1/2	4 3/4	20 10
Wednesday..... 44 1/2	96 1/2	12 00	4 3/4	20 15

Borax is easier, with better arrival; concentrated, Sci refined, 80c in car lots. Quicksilver is strong at an advance. Tin is quiet and fairly steady. Copper is dull and heavy. Lead is nominal. Iron at Philadelphia is not in a very satisfactory condition. Prices are unsettled and a little inclined to droop. The weakest articles on the list are steel blooms and billets, pig iron being the steadiest.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
F. K. MERRITT—San Francisco.
J. T. AUSTIN—Pittsburg, Cal.
Geo. Wilson—Sacramento Co.
J. H. CROSSMAN—Perris, Cal.
CHAUNCEY A. DAYTON—San Lucas, Cal.
G. R. GILL—Cambria, Cal.
WM. T. HEALD—Cloverdale.
MRS. GERTRUDE DECKERS—Fillmore, Cal.

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Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

IN AID OF SCIENCE—Walter Law, of W. J. Sloane & Co., of New York City, has presented \$1000 to the Lick Observatory for the purpose of publishing a series of enlarged heliographic plates of the moon, made from the photographs taken with the great telescope.

ALASKA PLACERS.—A large number of miners have returned to Port Townsend from Alaska. Good success in the placers is reported. At Silver Bow basin, \$12,000 was taken out in one day. Some nuggets from \$50 to \$240 were also found.

MINING AND SCIENTIFIC PRESS.

Assessment Notices.

CALIFORNIA AND ARIZONA MINING COMPANY.
Location of principal place of business, 330 Pine Street, San Francisco, California. Location of works, Mohave County, Territory of Arizona.
Notice is hereby given that at a meeting of the Board of Directors held on the 23rd day of September, 1891, an assessment (No. 4) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, 330 Pine Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 9th day of November, 1891, will be delinquent and will be advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
T. E. JEWELL, Secretary.
Office, 330 Pine Street, San Francisco, California.

NEW EL DORADO GOLD MINING COMPANY.
Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.
Notice is hereby given, that at a meeting of the Board of Directors held on the 23rd day of October, 1891, an assessment (No. 3) of Five Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 5th day of November, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 27th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

PROPOSALS FOR TUNNELS

OFFICE OF THE CHIEF ENGINEER OF THE Arrowhead Reservoir Company, San Bernardino, California, October 10, 1891.

SEALED PROPOSALS

Will be received by the undersigned until noon of TUESDAY, the 15th of December, 1891, for the construction of three tunnels—ons of about 2000 feet in length, the second about 4000 feet in length, and the third about 6000 feet in length, through rock, in accordance with plans and specifications on file in this office.
Proposals must be accompanied by a certified check in the sum of \$2000, to be returned to the unsuccessful bidders. The Company reserves the right to reject any or all proposals.
A. H. KOEHLIG,
Chief Engineer The Arrowhead Reservoir Co.

HORACE D. RANLETT,
Ores, Mining, and Commission,
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E. P. HEALD, President.
C. S. HALEY, Secretary.

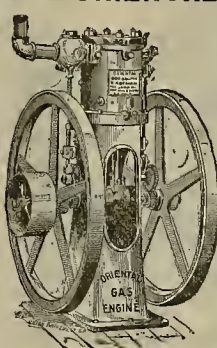
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Notice of Change of Office and Principal Place of Business.—Notice is hereby given that, with the consent in writing of the holders of more than two-thirds of the Capital Stock of the Keystone Consolidated Mining Company (a Corporation), the office and principal place of business of said Corporation has been ordered to be, and on and after November 1st, 1891, will be changed from Room 40 to Rooms 43 and 45, No. 310 Pine Street, City and County of San Francisco, State of California. Dated October 7, 1891.
M. J. McDONALD, President.
J. H. ISHAM, Secretary.

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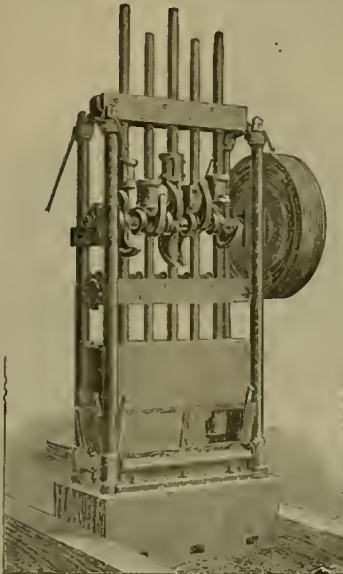
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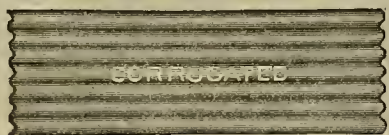
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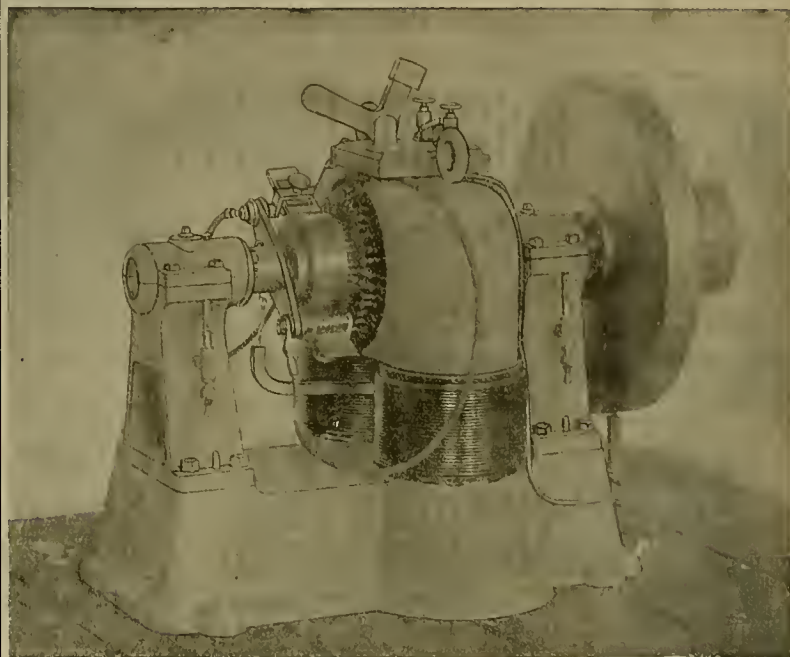
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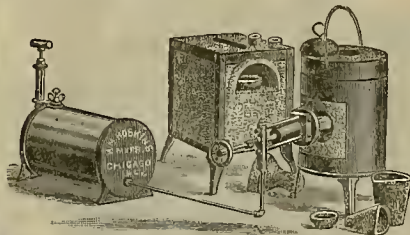
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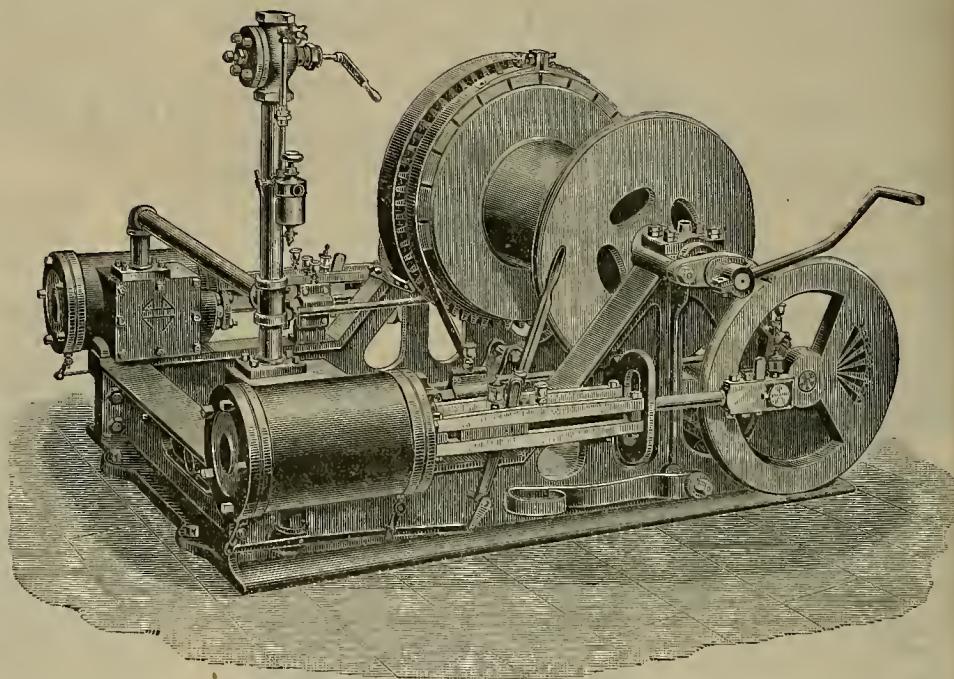
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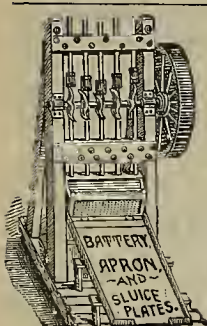
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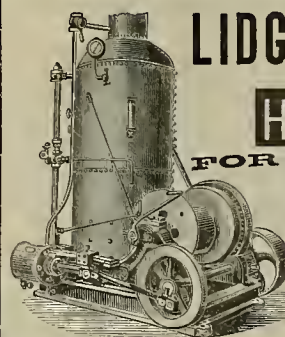
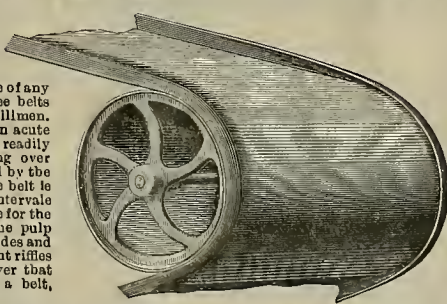
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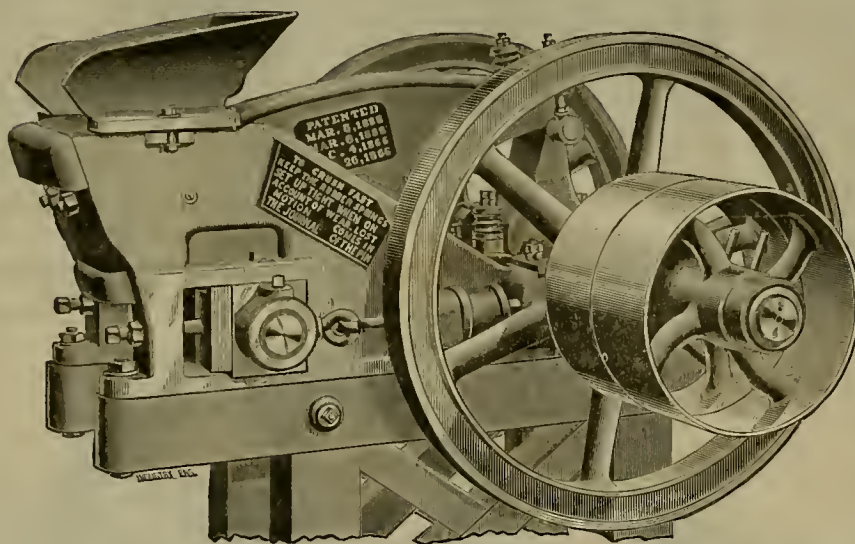
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WET AND DRY JIGS.

BULLOCK DIAMOND DRILLS.



DODGE IMPROVED ROCK BREAKER.

INGERSOLL - SERGEANT
ROCK DRILLS,
AIR COMPRESSORS

— AND —

COAL MINING MACHINERY.

WATER WHEELS,
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SAW MILLS,
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GENERAL AGENT FOR WESTINGHOUSE AUTOMATIC ENGINES.

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THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 1300 IN USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

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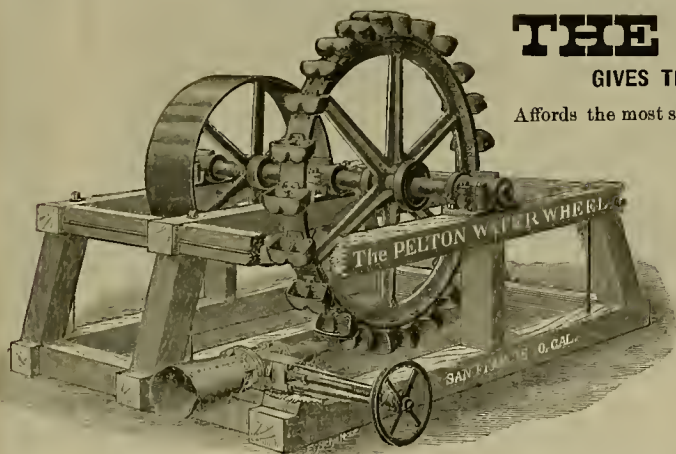
The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

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PELTON WATER MOTORS, Varying from the fraction of 1 up to 15 and 20-horse power, unequalled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. SEND FOR MOTOR CIRCULAR. Address as above.



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UNLIMITED IN CAPACITY. UNEQUALLED IN EFFICIENCY. UPWARD OF 3,000 NOW IN USE. Will do more than twice the work of any other with the same cost in wear. Gives a fineness of product that increases the capacity of any mill from 25 to 40 per cent without any additional expense. THE BEST AND ONLY CRUSHER ADAPTED TO MACADAM ROAD WORK. Send for Circular.

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It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

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CHEAPEST FORM OF TRANSPORTATION.

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ROCK BREAKERS.
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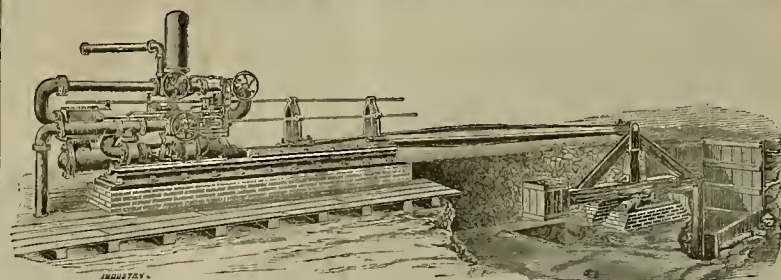
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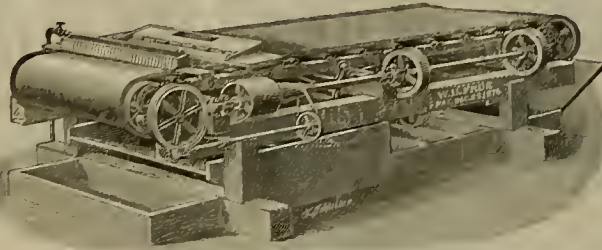
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We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

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For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



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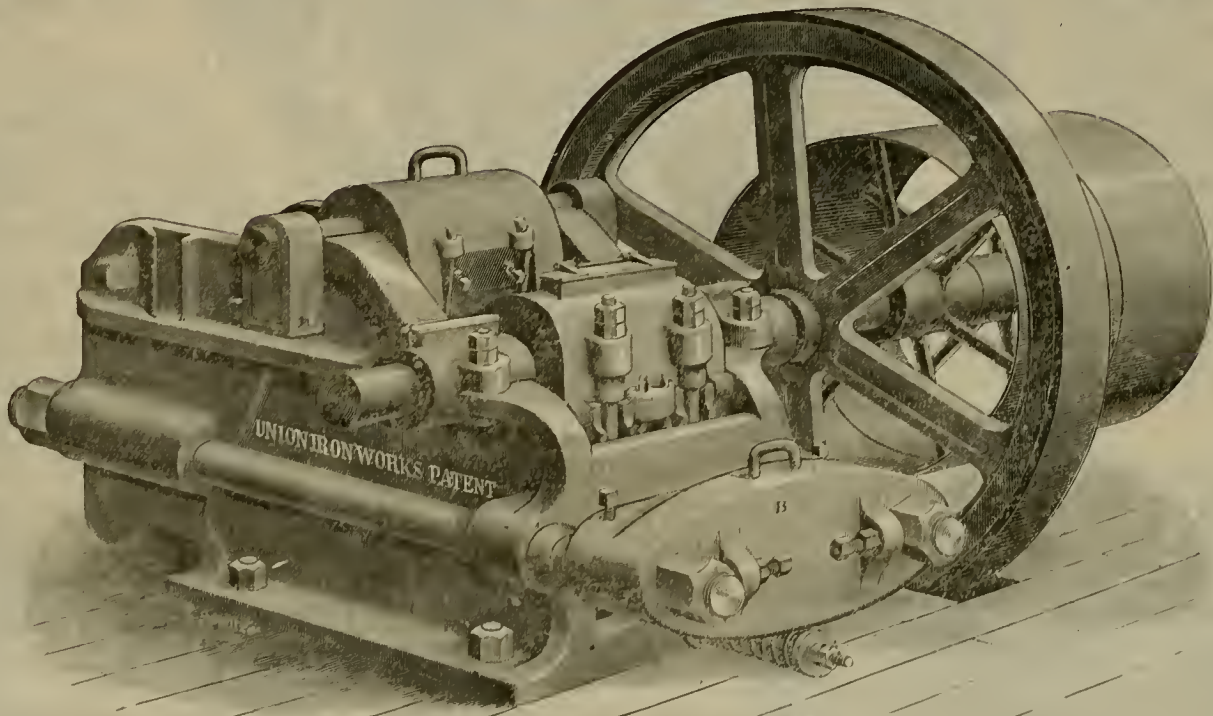
Price of Plain Belt Frue Vanner, \$575, f. o. b.

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Lead and Copper Smelters.
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METALLURGICAL, MINING AND MILLING MACHINERY

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BUILDERS OF U. S. GOVERNMENT CRUISERS AND BATTLE SHIPS.

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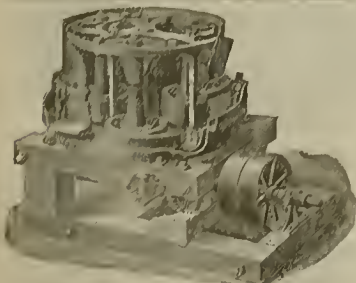
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Centrifugal Roller Quartz Mill.

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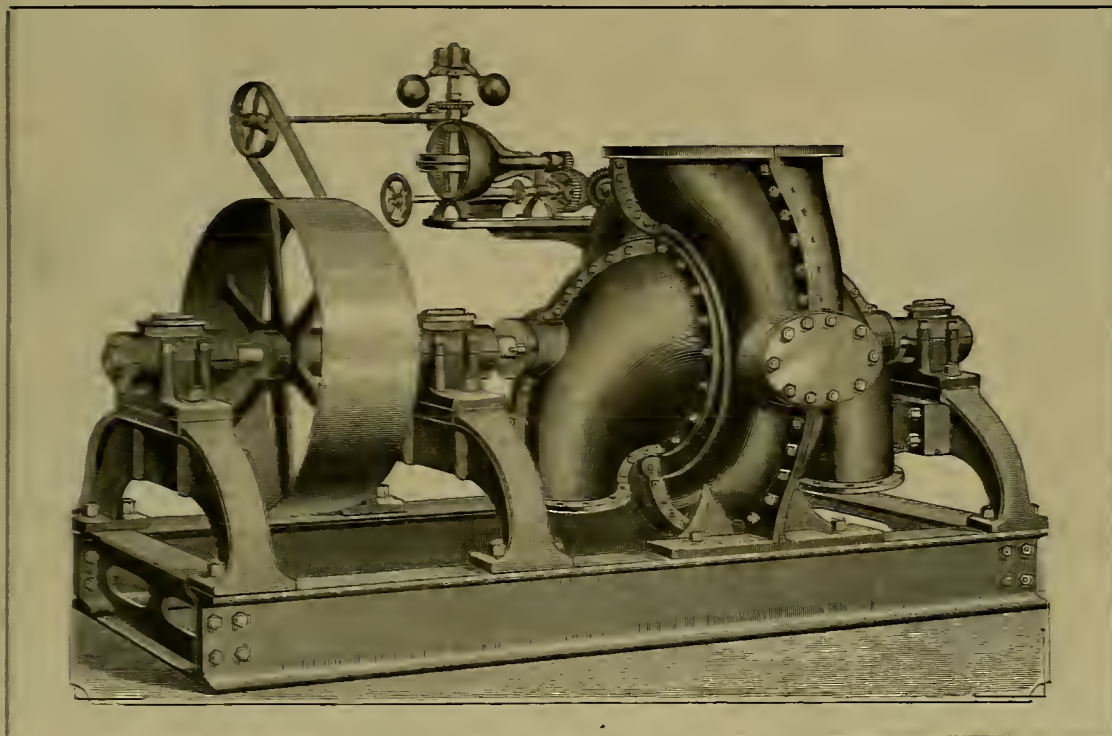
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. XLIII—Number 18.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 31, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.



NEW DOUBLE-DISCHARGE LEFFEL WATER WHEEL.

New Double-Discharge Leffel Water-Wheel.

The James Leffel Turbine water-wheel stands before the public a thoroughly tested and reliable hydraulic motor. The most exacting practical tests have proven the original design of this wheel to be such as secures the greatest economy of water at an average of full or part gate, together with great durability and ease of management with the highest useful effect.

It has been the aim of the James Leffel & Company, Springfield, Ohio, the manufacturers, to improve the minor working parts of the wheel, through greater accuracy in their formation, and superior quality of material. Nearly 30 years of diligent study and practical experience by the principal members of the firm, and the highly competent men they have now in their employ, has enabled them to effect these most desirable improvements, which are now to be found in all the wheels sent out from their works.

Our illustration shows the latest-style double-discharge Leffel water-wheels, on horizontal shaft. It is a cast-iron casing, joined and divided into a number of parts, in such a manner as to admit of separating them for the purpose of light transportation by pack-mules or men. When shipment can be made by the usual transportation facilities, the wheel is sent intact. In this form of wheel, great strength and compactness is secured without unusual weight. All sizes of this style from the smallest up to 30½ inches are manufactured.

(Continued on page 235.)

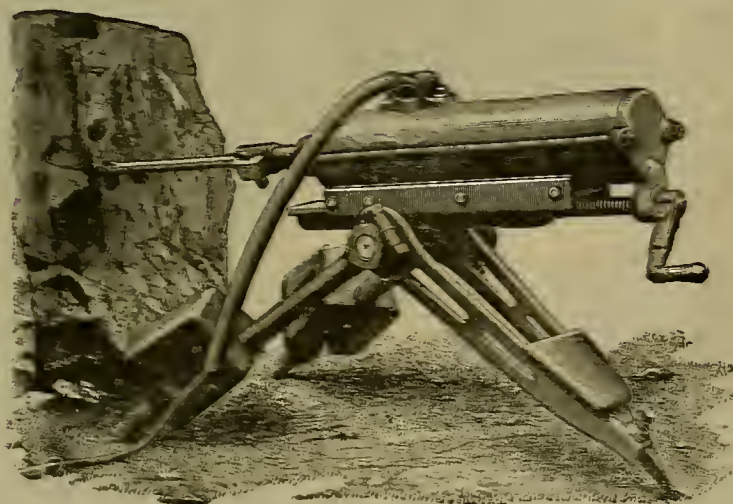


FIG. 2—MARVIN ELECTRIC DRILL.



FIG. 3—ELECTRIC COAL CUTTER.

(See page 234.)

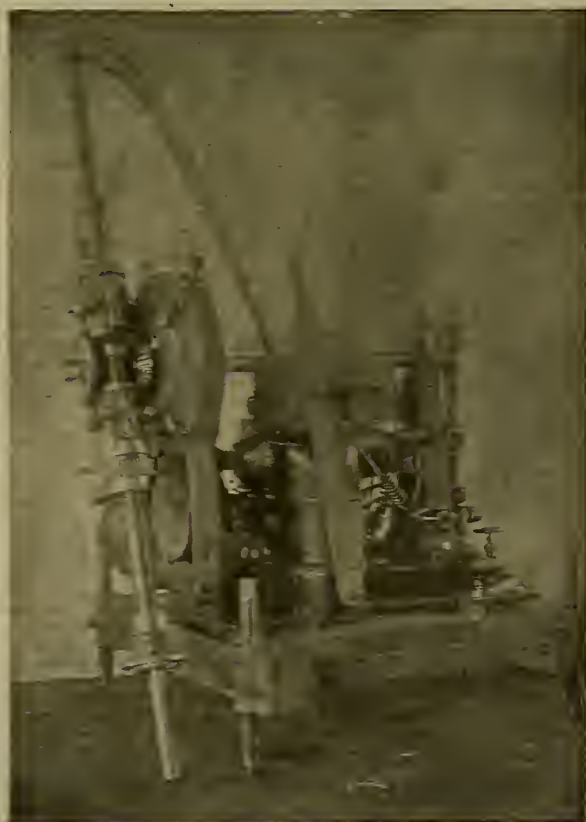


FIG. 1—ELECTRIC DIAMOND DRILL.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Products of the Mining Counties.

Agricultural and Horticultural Conditions.

EDITORS PRESS:—Perhaps some of the PRESS readers would like to know a little more about the counties that I have traveled through on my late trip in Tuolumne, Calaveras, Amador, El Dorado, Placer, Nevada, Sierra, Plumas, Tehama, Shasta, Butte, Sutter and Yuba.

Tuolumne

Has a large body of farming land in the hills. This is principally devoted to wheat, though there are little valleys high up in the mountains, where fruit, potatoes and grass-hay are grown to a good profit. Lower down, along the line of the mining towns, are a large number of small ranches devoted to fruit and vegetables. Still lower down is a plain, where wheat forms the principal crop. In the lower part of the county, near Chinese Camp, are several very fine and extensive fruit ranches. The mining towns furnish a good local market. The climate is all that could be desired. Taking the county as a whole, it is safe to say that anything can be raised in Old Tuolumne, and with the same degree of profit as in any portion of the State.

Calaveras.

The upper part of the county is very mountainous, with here and there a choice mountain ranch, where potatoes, hay and apples are grown at a high profit. At West Point, which is about the highest town in the county, the fruit ranch of Mr. T. R. Smith shows the heaviest crop of fine fruit that I have seen any where in the State. Along the foot of the upper mountains, as at Murphys, Douglas and Vallecito, are a succession of fruit and vegetable ranches, largely owned by Italians. Below this is a dry range of country that could be irrigated, if desired. This section is used in growing wheat and barley hay. Below this is the fine Salt Spring valley, with its great extent of wheat fields. Valley Springs is another charming valley, principally used in growing wheat. Below this follows a section where fruits, the orange and olive, are largely and successfully grown. Still lower comes the black, loamy lands along the rivers, where any crop can be grown.

Amador.

The upper portion of Amador county differs but little from Calaveras in her mountain ranches; as you go lower down, but still in the mountains, follow the vegetables and fruit ranches of the Italians. Still lower down come the wheat fields, and along the rivers and spreading out into the Sacramento valley a class of land that for fertility and general adaptation to all manner of farming, cannot be excelled. The famous Q ranch of Mr. Geo. Woolsey, near Ione, shows how well fruit will do in this section.

El Dorado.

The lower part of the county is devoted to grazing and wheat, though a belt is given to fruit culture—from Shingle Springs, El Dorado, Diamond Springs, Placerville and across to Coloma. The fruit interests are now the leading ones in all this section. Above this, as at Garden Valley, Grizzly and Georgetown, are fine mountain ranches devoted to hay and apples.

Placer.

The extent of the fruit industry throughout the belt from Lincoln and Roseville up to Rocklin, Loomis, Newcastle, Auburn, Applegate and on up to Colfax, is so well known that it is hardly necessary to dwell upon it. The whole country is fruit, with the peach predominating, though all the other fruits and crops do equally well. It is a difficult matter to say which is the better part of the county, as those on the Granite, or lower irrigated belt, claim that their soil and location are best adapted to fruit. As you reach Auburn and get on to the slate soil, the people here are equally emphatic in claiming that their soils are the best; while the people on the upper unirrigated soils claim they have the best of it. To an outsider it looks as though the early irrigated belt would prove the best for shipping fruit; the higher lands the best for canning or drying fruit, as it is more firm and meaty, while the still higher soils excel in the fine grapes of Colfax and the general excellence of the pear crop. Now don't infer that peaches are not grown up there, for you will find the peach all the way up, and fine ones, too, while the olive, fig and orange are grown and produced wherever found. Placer is the leading fruit county of the State.

Nevada.

The fruit interests of the county seem small when compared with Placer, but the fruit grown is none the less good. Nevada justly claims to be in the Bartlett pear and apple belt. In these she excels, though she raises oranges, figs and peaches equally as well.

There is not the same extent of farming land in Nevada that is to be found in Placer, as Nevada's principal interests center in her famous mines; but there are some very choice pieces of land extending from Chicago Park across to Rough and Ready and up to North Bloomfield. The famous Barren Hill Nursery of Mr. Felix Gillette is situated at Nevada City, where a practical demonstration of the capacity of the soil is shown in the great variety of fruits and nuts that adapt themselves to this soil and climate.

Sierra.

Driving up through the mountains, you form the opinion that Sierra's wealth is in her mines, as the ranches are small and not numerous; but when Sierra Valley spreads out at your feet, with its great extent of grass-covered acres, you are forced to think otherwise. The principal crop is hay, though dairying and stock-raising are largely followed.

Plumas.

Who can do justice to Plumas in mid-summer with her emerald gems of mountain meadows, scattered from end to end, a succession of gems separated by grand old mountains whose feet are washed in crystal streams that the toothsome trout, with an eye to the beautiful, has selected for his summer home. Dairying and stock-raising are here the principal occupations of the people.

There is a prospect of a railroad being built to this, the Switzerland of California, this year. Should it run up from Oroville, take a trip to this section next summer and satisfy yourself that life is worth living if it includes a trip to Plumas every summer.

Lassen.

This county has an excess of lava, which, while it covers a vast area, makes the land not covered all the more attractive and desirable. Clover Valley, Long Valley and a large section surrounding are given up to dairying. Along the Honey Lake section, from Milford to Susanville, is a succession of farms where hay and fruit are grown. The principal interests of the county may be said to be in the direction of hay, stock and butter.

Tehama.

The lower portion of the county does not differ from the rest of the Sacramento valley. As you get up higher the crops change from the great extent and large holdings of wheat lands to small fruit ranches. The country is mostly level, except the barren strip along the east and bordering on Lassen. Very fine fruit is grown on the rich bottom lands of the county, though the uplands do very well. The soil runs from loam to gravel. The wheat and sheepmen own the bulk of the county and in consequence wheat, wool and mutton are the main products, with fruit fast gaining on them.

Shasta.

About Redding and below is a belt that differs but little from Tehama, being level land, where wheat, stock and fruits are grown; above, the country becomes very mountainous, and while there are occasional small farms, the principal interest is the rich and extensive gold quartz mines which afford a good local market for the farmer.

Butte.

I doubt if there is a county in the State where there is so little land that can be called waste land. The hills take up but a small portion and there is an absence of alkali and hog-wallow lands in the plains. Gen. Jno. Bidwell's famous Rancho Chico shows how well the rich soil of the valley is adapted to all manner of fruits; though Oroville, with her mild climate and orange groves, proves that the hill lands are equally valuable. Fruit is rapidly coming to the front all over the county, and in time will be the industry of the county.

Sutter.

The owners "know a good thing when they see it," and so have located here and make the fruit-growers happy by contracting for their crops, while the trees are but in blossom. The principal fruits are the peach and apricot, which here, on these rich lands grow to the greatest degree of perfection without irrigation, and there are thousands of acres just as good now growing grain that in time will pour out a harvest of golden fruit that can be increased in extent, until it equals the present output of the entire State.

Yuba.

Yuba's red soil is generally given to grain, but along and near the river edge are rich belts that leave nothing to be desired. At Wheatland is a long rich belt of river bottom land that makes one feel as Moses must have felt when he viewed the land he was not allowed to set foot on; for the only fault that I could ever see in this section was the fact that none of it is for sale. On this rich belt hops, alfalfa, corn, vegetables, fruits and any crops sown or planted produce in greatest abundance.

A General View.

It is a difficult matter to thus briefly describe the characteristics and products of the different counties, but if I were seeking a home—now hear in mind this is an individual opinion and not that of the PRESS—if I wanted health, I should prefer the mountains; if fruit was my hobby and I wanted to ship East, I should take Placer Co.; if for canning or drying, Sutter, Butte, Yuba, Tehama and the lower part of Amador; if the dairy, then Plumas or the Sierra Valley of Sierra county, or some of the choice valleys of Lassen; if I wanted a good home market, the mining counties. But it is all California, and with the exception of a few of the higher counties the same crops can be grown in some parts of all, from the orange to the apple. What the farmer wants most is a profitable market; given this, and every acre will be made to bring forth fruits. Supply follows demand, and when there is a general profit in all branches of the farm there will be no need of "Immigration Societies."

With thanks to the good people all along the

line whom it has been the good fortune of the writer to meet on this trip, I remain yours respectfully,
E. H. SCHAEFFLE.
At Home, Murphys, Cal.

Hydraulic the Mud from Our Waters.

EDITORS PRESS:—The fact that the railroad freight rates of this State have for many years been from five to ten times as much as the Eastern rates is just beginning to be understood as the reason why our people are not more prosperous, when in everything necessary for the prosperous maintenance of a much larger population, our State stands pre-eminently in the front.

We have products of infinite variety in abundance that the world at large wants and will take at reasonable rates; but our ways to market have been closed by combinations and high charges, to the extent of leaving the producer without profit or any hope for the future.

We cannot have real prosperity until legitimate competition is provided, and I know of no quicker or more economical method than to open up the water-ways of our State. The agricultural portion of the State is principally in the valleys, in which are streams that were once navigable and which, if reopened, would furnish the necessary competition.

In order to accomplish this, I would advise those owning stern-wheel steamboats to provide a suitable steam pump of good power, connected with steam and water pipes, to draw water from under their boats, and deliver it, with suitable pipes and contracted nozzles, at the stern of the boat, under the water, at an angle of about 45 degrees, so that the force of the jets would stir up the mud in the stream's bottom, and would also assist in the propulsion of the boat and in forcing the mud down stream. Successive boats following each other in the same channel, together with the concentration of water into the narrowed channel with its accumulated scouring force, would, I think, soon deepen the stream enough for boats of large tonnage.

Such a pump, with a single large hose, could be used to extinguish fires on the boat or at her landings, or as a fire boat, and also to hydraulic away impediments to navigation, in narrow, crooked creeks and sloughs, or in piping out landings for farmers or others, and if the plan is practicable, short lines of good roads would soon be established, leading from the various settlements to the most favorable landings, and thus provide cheap transportation for perhaps nine-tenths of the heavy products of the State. Even gravel, hars of moderate width in the upper rivers, might be cut through by this method, if undertaken at a season when the water was favorable, or the many sloughs and creeks around the hay—that are now only navigable at high tide—might be cut deep enough to be used at all tides, at a moderate expense.

Even the mud in the harbor of San Francisco could, I think, be piped out at strong ebb tide much cheaper and quicker than it has been done, and I would suggest to the Harbor Commissioners that it would be well to try an experiment of this kind with the fire tug, Gov. Irwin, at the north end of city, by letting down her hose, properly weighted, into the mud at strong ebb tide and see whether the mud cannot be floated away more rapidly than to take it out by the bucketful.

It will require but little money or time to ascertain whether the method offered is practicable or not. The mountains are being washed gradually into the sea by Nature's process and man's ingenuity, and with but little assistance in the same direction by agitation and concentration of the waters in narrow channels, the law of gravitation will do the rest.

Oct 19, 1891.

R. G. SNEATH.

Calico District.

EDITORS PRESS:—The Silver King mine is shipping 60 tons per day of good ore to the Waterloo mill. The output of this mine has been increased 100 per cent since the narrow-gauge railroad was built here.

The Waterloo is running as usual, and making a daily output of about 50 tons.

The Waterloo Mining Co.'s 60-stamp mill is running steadily on ore, and their 15-stamp mill on tailings which were run through the mill some years ago.

The Silver King Mining Co. keeps its mill active, with ore from the Oriental, No. 2, Red Cloud, Mammoth, Silver, Odessa and Occidental mines. This property is improving daily.

From the Bismarck mine, chlorides have been taking some very good ore. There are at present 150 tons of high-grade ore upon the dumps of this mine awaiting treatment.

A new five-stamp mill being erected by Stephens will be in running order about the 1st of November. This mill has been erected to treat ores from the chlorides of this camp. The Alvord, a new company, is about to erect a 100-stamp mill at this gold mine of fame.

MINER.

Los Angeles Coal.

Coal has been discovered on the ranch of O. E. Roberts, three miles west of the city limits of Los Angeles. The locality is near Hollywood, at the edge of the foothills, about a mile this side of the Cahuenga Pass and half a mile north of the terminus of the dummy line which connects with the Temple street cable road. Mr.

Roberts related to an *Express* reporter to-day the story of his discovery. "We wanted water," said he, "and thought we ought to strike it in a sandstone ledge which crosses my place and shows plainly at the surface. The whole ranch is underlaid by sand rock, but this ledge is of a different sort. It is from 50 to 200 feet wide. We began two weeks ago to sink a shaft on the ledge, and are now down 65 feet, in sandstone all the way. At a depth of 50 feet we struck a carbonized ledge, which is from six to seven feet in width, carrying veins of coal that are from an inch to three inches wide. We are now running a drift to follow a vein of coal which shows 13x3 inches. The drift is in four feet from the shaft. I think we are bound to develop something of value and importance. We have tested some of the coal in a blacksmith's forge, and it burns well, giving out a strong heat. It seems to be fully as good as the ordinary blacksmith's coal." Mr. Roberts showed some specimens taken from the coal veins, and also of the sandstone ledge in which the coal is found. The coal seems of fair quality. It is of the so-called soft, bituminous sort, compact and heavy, and entirely distinct from the lignite which has often served as the basis for an announcement of "coal" discoveries in this State. The present development may be regarded as at least encouraging and hopeful, and it is important as indicating the presence of carboniferous ledges in this neighborhood. Should a vein of coal a few feet in width be developed near Los Angeles, it would prove a valuable property.—*Express*.

A Great Live Stock Enterprise.

Within a few months, there has been organized and pushed to a fair stage of progress, one of the largest enterprises that has been undertaken on this coast for many years. One that is likely soon to arouse the lively interest of a large class including capitalists, manufacturers, stock-raisers, workmen and home-seekers, about equally. Although less than 12 miles, and but 30 minutes by rail from the business center of San Francisco, so quietly have the projectors' movements been made, that comparatively few know of the great work already done, and still less realize the magnitude of the general plans and improvements contemplated.

A little more than a year ago, the South San Francisco Land & Improvement Company composed of well-known Chicago, Omaha and local capitalists, was organized for the purpose of creating and promoting a manufacturing and residence suburb to the city of San Francisco that should combine as far as possible all the attractive and practical advantages of location obtainable. With this object in view, after a careful survey of the field, the company, through its resident manager, Mr. Peter E. Her, purchased a large tract of land in San Mateo county, adjoining the city and county line of San Francisco, having a water frontage on the bay of about seven miles. This body of land includes the old Miller & Lux stock ranch, as well as several adjacent holdings, and aggregates some 3400 acres.

The Aims and Plans

Of the company are clearly defined, but are on such a broad and comprehensive basis that an outline only can be given here. Among the leading features of the enterprise which will prove of special interest to readers of the PRESS is the establishment of an extensive abattoir, packing and canning plant upon the latest and most perfect plan, and with the greatest capacity of anything of the kind now in existence; also fertilizing works, stock-yards and horse sales-stables. These, in connection with a deep-water ship canal and basin, railroad tracks and wharves, affording ample shipping facilities, are already under construction, and will be speedily followed by the erection of a hotel and an exchange building on a correspondingly liberal scale.

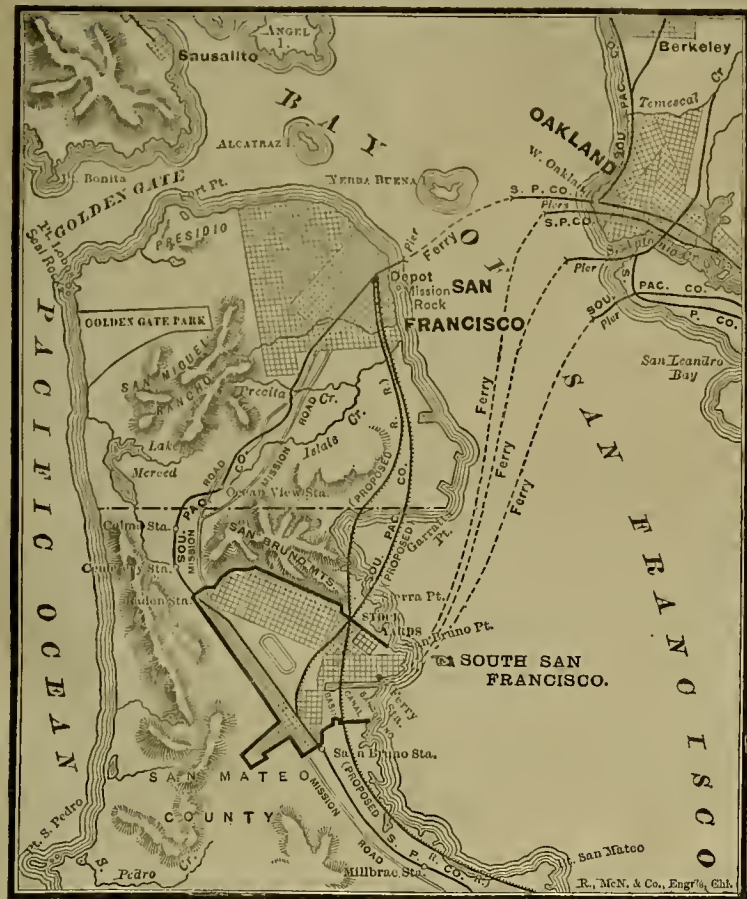
It is thus proposed for the first time to give the farmers of this and adjoining States a permanent live stock market, where they can find ready sale for their horses, mules, cattle, sheep, hogs, hay and grain—an important fact in itself, not likely to be overlooked by those engaged in these industries. Manufacturing interests will also be provided with every facility in the way of rail and water communication with all parts of the world, as well as cheap and convenient building sites. Such inducements can hardly fail to attract iron and wood workers, lumber interests, brick and coal yards, tanneries, and a host of industries that naturally follow in their train. But by no means stopping here, the company has subdivided and graded streets on a very desirable part of its immense tract for residence purposes. This is high ground, easily drained, and so situated in relation to the manufacturing district that the latter can never prove objectionable.

First-class water-works, fed by artesian wells, are to supply the town with the purest water for all uses and at nominal rates, pipes being laid in front of all property. Concrete sidewalks will be laid on all the main avenues, and a complete system of sewerage will also be constructed as soon as requirements demand it. Many other improvements are under way and enter into the plans of the management, such as banks, hotels, museum and library, fair ground and race-track, electric light and power plant, also an extensive system of electric roads which will supply ample means of intercommunication within the town limits.

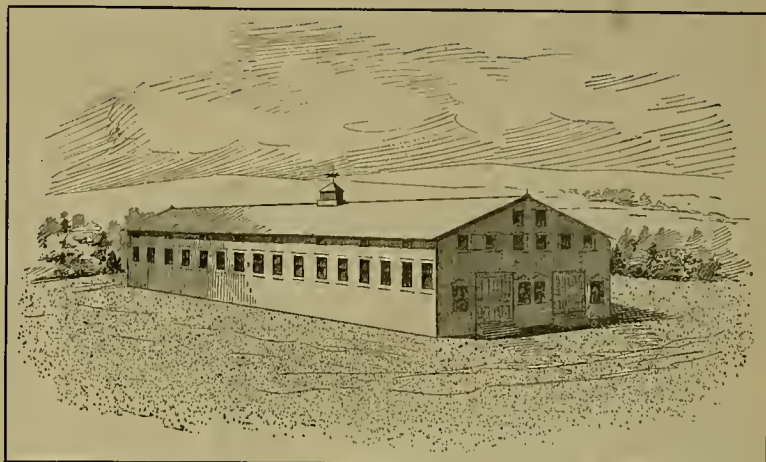
These proposed designs are to be carried out

upon the most approved methods that modern science and mechanical skill can furnish, and together with the hay shore out-off, now being built by the Southern Pacific Railroad across the company's property, will give to the resident or business man of this young city every metropolitan convenience and comfort.

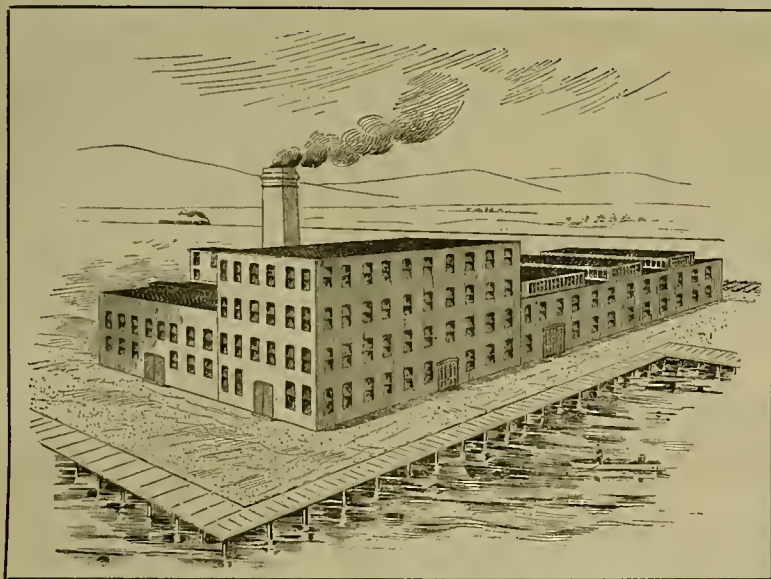
machinery on the ground to be put in place as soon as the buildings are ready for its reception. The company is conducting most of these heavy operations under its own direct management, and is proposing to push the work with still greater energy during the coming year.



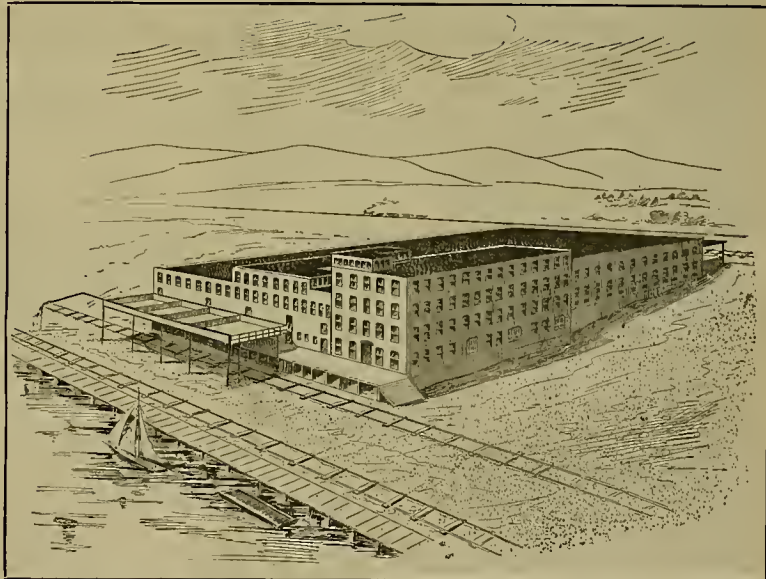
EXCHANGE BUILDING.



HORSE SALE STABLE



FERTILIZER AND DRIER BUILDINGS, ENGINE AND ICE MACHINE, ETC.



ABATTOIR BUILDING.

A GREAT LIVE STOCK ENTERPRISE NEAR SAN FRANCISCO—SITUATION AND BUILDINGS IN CONSTRUCTION.

The map and illustrations on this page show the favorable position occupied by the town and its unlimited transportation possibilities.

Work Accomplished.

Early in February of this year, a meeting of the Board of Directors was held in Bidden, on the site of their prospective city, at which \$450,000 was appropriated toward dredging the ship canal and tidal basin, erecting abattoirs, meat-canning factories, stockyards, grading the main avenues, completing water works, sinking artesian wells, etc. This sum to be supplemented from time to time, as the work progresses.

A representative of the PRESS who visited Bidden recently, to learn what this large amount of money was accomplishing, found a force of about 300 men engaged in pushing the work rapidly forward, as per program. The grading of Grand, Swift and Railroad avenues was found to be nearly finished. Two artesian wells are flowing over a million gallons in 24 hours. The stockyards, abattoirs, fertilizing works, ship canal and basin are all in an advanced stage of construction. Of the latter, over a half-mile of dredging and pile-driving is completed, while there is a large quantity of

The South San Francisco Land and Improvement Company is incorporated with a capital stock of \$2,000,000, all of which has been subscribed. It is to exist 50 years, with its principal place of business at Bidden, San Mateo county, California. Gustavus F. Swift, one of the largest packers of meats in the world, with packing houses in Chicago, Omaha, and Kansas City, is the President; Charles W. Smith, formerly vice-president of the Atchafalaya Topeka and Santa Fe Railroad Company, Vice-President; Peter E. Her, one of the largest stockmen of the west, 2d Vice-Pres., and Sec'y., E. R. Lillenthal of San Francisco, Treasurer; Obed Horr of Chicago, Auditor. Prominent among names of the stockholders are: P. E. Her, Nelson Morris, Edward Morris, G. F. Swift, Armour & Co., J. B. Greenbut, H. J. Crocker, J. H. and G. M. Bosler, Charles W. Smith, Miller & Lux, N. Merriam, Livingstone & Co., S. W. Allerton, E. R. Lillenthal, C. W. Craig, J. A. Creighton, H. Keuntz, M. C. Keith, E. F. Hooker, Horne & Chapman, L. W. Hill, P. Bocqueraz, A. H. Veeder, M. Cudaby, H. S. Crocker, J. McCullough, E. J. Martyn, H. Sensinbach, Wm. L. Merry, A. L. Meyer, Kullman, Salz & Co., A. Bessenger, Jas. Hunter M. Erlsbach and B. F. Smith of Boston.

The live-stock interests of the State have long felt the need of a more perfect system for conducting their business, and an outlet for a class of meat that is better adapted for packing than for the retailers' stalls. This immense packing and meat-canning establishment seems likely to meet the requirements.

Mechanical Engineers Coming.

A committee of the Technical Society of the Pacific Coast called a meeting at the Mechanics' Institute on Saturday, Oct. 17th, of a number of gentlemen interested in mechanical and civil engineering, the intention being to get an expression of opinion in respect to the entertainment of the members of the American Society of Mechanical Engineers, should that society visit this city next April, as is now being considered.

At that meeting it was decided to name a committee of representative citizens who should meet and decide on ways and means to carry out this object.

The committee selected is as follows: Governor H. H. Markham, John Richards, Geo. W. Dickie, James Spiers, Irving M. Scott,

Robert S. Moore, A. W. Stahl, W. R. Eckart, P. Noble, Ira P. Rankin, Byron Jackson, A. P. Brayton, Oscar Lewis, James G. Fair, S. W. Henshnst, Chas. Marschutz, H. J. Small, Herman Schnsler, Chas. G. Yale, Mayor G. H. Sanderson, Joseph Crockett, Horace B. Gale, J. D. Spreckels, F. C. Hesse, J. W. Moore, Marsden Manson, Chas. Goodall, Wm. H. Henr, A. H. Payson, A. S. Hallidie, Geo. E. Dow, John Hays Hammond, Ang. J. Bowls, E. J. Molera, H. W. Harkness, J. B. Stetson, A. Sutro, Otto Von Geldern.

The American Society of Mechanical Engineers is one of the most distinguished bodies of the kind in this country or abroad. It embraces not only nearly all the eminent mechanical engineers, and a large number of civil engineers of the United States, but also many distinguished members from other countries.

This society, the Associations of Civil and Mining Engineers, make up the three great technical bodies of the kind in this country, and it is expected that a visit here of the Society of Mechanical Engineers will be followed by similar meetings on this coast of the mining and civil associations.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ENCOURAGING.—*Amador Ledger*, Oct. 21: Mining interests are looking encouraging. At the Hector they are making preparations for taking the water out of the shaft so as to explore the bottom level, which at the last 100 feet of sinking was not drifted a foot. Mr. Valentine feels satisfied, from all the information that he can gain, that they will strike a paying ledge at this level. Sinking at the Wildman is to be deferred a little, on account of some needed repairs to the shaft, also to the pumping machinery, which they are now very busy putting in order. Sinking at the South Eureka is going along rapidly. They are down about 200 feet. The ground has become somewhat harder, which will necessarily retard progress to some extent. Small stringers of quartz appear in the shaft, which indicate that the ground is not barren. Developments at the North Star are a little more favorable. The ground has become so soft that timbering is necessary. They are in a slate or gouge formation. They will run on to the end of the month, when it is probable unless something of a definite character turns up, the work will be abandoned.

MISCELLANEOUS.—About 60 tons of ore from the White claim, north of Jackson, has been hauled to the Amador gold mine for crushing. Ten stamps of the Amador mill have been put in running order to crush this rock, and the mill was started Monday last. George Thomas, who has bonded the White mine, is having this ore crushed to test its quality. The rock to all appearance is very similar to that of the Zelle. It is of the greenstone character, and is heavily charged with sulphurets. At the Hardenburg mine, sinking was inaugurated a couple of weeks ago. They are keeping the ten-stamp mill running steadily and sinking at the same time, and expect to do so right along. Walter S. Jones of San Francisco has bonded the Gold Mountain quartz mine, at Quartz mountain, Lower Rancheria, from Maurice Dore of San Francisco, for the sum of \$30,000, \$10,000 to be paid Oct. 1, 1891, balance on or before March 1, 1892. At the New York mine, the roller stamp-mill is in place, and the work of laying the pipe to convey water to the mill will be completed in a few days. It is expected to start the mill by the middle of next week.

Calaveras.

SANDY BAR.—*Calaveras Chronicle*, Oct. 21: Supt. Davison reports that the Sandy Bar mine is now extending the tunnel (No. 2) on the lead. The lead is three feet wide, showing a large amount of sulphurets. As soon as the ore body, known to exist about 25 feet farther in the hill, is encountered, more men will be put on and stoping of ore will then be done.

RICH ROCK.—We were shown some very rich rock last Wednesday that was taken from the Lone Star mine, at West Point. The rock was taken from the lead at a depth of 500 feet from the surface. We are informed that there is enough of the ore in sight to repay the owners for all outlays up to the present time.

IT WAS PATENTED.—*Calaveras Prospect*, Oct. 24: G. M. Stage and other parties from near Burson have recently been prospecting on La Chapelle Flat, near El Dorado, but have been obliged to quit. It seems the parties located a mine there on what was supposed to be vacant land. They went to work in good faith, had their claim surveyed and duly recorded. They sunk a shaft about 60 or 70 feet, found the channel and a very good prospect. Then comes Phil Harkins, and from what was done, the parties became suspicious that all was not right, and on a more careful examination of the records, found that the ten acres they were at work upon was a part of Harkins' patented mine, and they were obliged to vacate.

El Dorado.

NOTES.—*Georgetown Gazette*, Oct. 22: Some new machinery arrived for the Van mine this week. We are pleased to hear that the unpleasant conflict which has existed in the Taylor mine affairs has been settled. The Stanton Co. have finally cleared the old 52 tunnel in the Jones Hill mine, and are now taking out pay gravel. Col. Dent and James Davis have begun development work on their seam-pocket mine on Crane's gulch south of town. We hear that the bonders of the Darling mine are so well pleased with the results of their extensive development of the mine that they have purchased it outright. The Blue Rock Co. is cutting a new ditch from Canyon Creek, and making other improvements. The Beattie mine was recently equipped with a new line of sluice-boxes. The Georgia Slide mines hold their own right along. J. H. Anderson started up the old Parsons mine last week, and the work of washing away the deep surface ground of this famous rich pocket mine through the long line of new sluice-boxes begins favorably.

Humboldt.

MAPLE CREEK COAL.—*Blue Lake Advocate*, Oct. 27: The *Advocate* had a call the middle of the week from J. J. Kehoe of Eureka, who was on his way home from the Preston coal mine with some samples of coal. Four men have been at work right along, and the shaft is now down 35 feet. The deeper the shaft is sunk, the better the quality of coal seems to be. The men are following the course of the principal vein, which dips at an angle of 45 degrees, and Mr. Kehoe further declares that careful observation discloses the fact that outcroppings of coal are numerous in the neighborhood of the mine, and that at one place, one mile and a half northeast of the scene of operations, another vein as large as the one being worked has been discovered.

Inyo.

DARWIN.—*Inyo Independent*, Oct. 23: George Lewis went to Darwin on Wednesday to see how matters are progressing in the mine being operated there by himself and P. H. Mack. He took with him supplies of all kinds, including implements needed in mining. H. Hamilton also went down and will work there during the winter. At last reports the mine was looking very well and a considerable quantity of ore was being taken out.

Nevada.

ENCOURAGING.—*Grass Valley Union*, Oct. 22:

The quartz mining prospects in the Grass Valley district are very encouraging at present. The old mines are doing as well as usual, and the new mines are showing remarkably well. This is by far the best quartz-mining district in California.

RETIMBERING SHAFT.—*Grass Valley Telegraph*, Oct. 20: The Omaha Co. has begun work on the Lone Jack shaft. The shaft will be retimbered from the top to the bottom, and all first-class lumber will be put in. The shaft is 300 feet in depth. While the timbering is going on, quartz is being hoisted through the shaft.

CLOSED DOWN.—The Boston mine in Eureka township has shut down because of a failure to find sufficient paying ore. McBean, Mead and Peard, however, own an extension of the Boston, and in that extension, called the Rainbow, there is a large ledge of good ore.

THE TELEGRAPH MINE.—Buildings are now being erected on the Telegraph mine to inclose the machinery which is ready on the ground to be put in place. The Telegraph adjoins the W. Y. O. D. mine, and is certainly favorably situated for a good future. A limited amount of stock is now on the market for sale at 50 cents per share, payable in installments, and is being readily taken. The shaft on the mine is down 100 feet and all the machinery and everything else paid for to date.

THE BOSTON SHUT DOWN.—*Transcript*, Oct. 19: Thomas Peard returned last night from God's Country in Eureka township where he has been superintending operations at the Boston quartz mine. Work has been suspended at the mine because of a failure to find ore that can be profitably worked. Messrs. Fernbach & Co. have expended about \$40,000 there, \$25,000 of the money being invested in a fine mill. Adjoining the Boston is a mine called the Rainbow and owned by McBean, Mead and Peard who have developed a large ledge of good ore. They have about 100 tons out and will work it at the Boston mill.

A BONANZA OF COPPER.—*Nevada Transcript*, Oct. 24: While in town last night on his way to San Francisco, Dr. R. McKillican, the well-known merchant and mining operator of North Bloomfield, exhibited some specimens of copper ore that were viewed with much interest by all who saw them. They came from the Bull Run ledge, which is situated about half a mile above the town of North Bloomfield. Twenty-one years ago, while Mr. McKillican was superintending the construction of a wooden dam then being put in at Bowman's, he discovered the deposit and immediately located it. He prospected it superficially, and became convinced that it possessed great extent and richness. During the seventies, he erected hoisting works and sank a distance of 40 feet, with encouraging results, when he was called by business to San Francisco, where he remained for some time. During his absence, Frank Souchet relocated the claim, and upon his return, Mr. McKillican bought him out for \$1000 and obtained a United States patent. This summer the owner had a drain tunnel of 150 feet driven, and upon reaching the ledge, found it to be 20 feet thick at the point opened upon. The copper carries seven per cent of silver, also about \$5 in gold to the ton. Mr. McKillican, who has had years of experience as a mining engineer and expert, and has been very successful in his own investments in the industry, says that North Bloomfield is in the same belt as Saco and Copperopolis districts. He regards the Bull Run as one of the most important developments ever made in the county, and it is his intention to soon direct his attention to the working of the claim on an extensive scale.

SEVEN-THIRTY MINE.—*Grass Valley Telegraph*, Oct. 21: The parties holding the bond on the Seven-Thirty mine are ready to go to work in further development of the property, but as delays that could not be avoided have occurred, those holding a bond want an extension of time from the owners of the property. This will probably be arranged and the Seven-Thirty will soon be showing up like its neighbor, the California. These two mines are close together and are supposed to be on the same ledge. The Seven-Thirty's history as a gold producer is a brilliant one.

LONE STAR MINE.—The work is being steadily pushed at the Lone Star mine in Sierra county. The principal owners are Grass Valleyans, all of them being mining men of more or less note. The new tunnel is now being run and is in 400 feet. It is supposed that 100 feet farther and the tunnel will tap the large ledge. The ground is very hard and progress at present is both slow and expensive.

VERY RICH INDEED.—*Grass Valley Telegraph*, Oct. 19: Late this afternoon news came to town, and it is reliable, that the California mine, situated on Deadman's Flat, had struck it richer than ever. The north drift has tapped a ledge literally filled with gold, and it is with pardonable pride that the owners speak of what seems to be the greatest thing ever struck in this part of the county.

OMAHA MINE.—On Saturday last there was quite a ripple of excitement about an "immense" strike in the Omaha mine. Our reporter interviewed Superintendent Geo. Mainhart of the mine, and he informs us that there was no cause whatever for undue excitement; that they struck a two-foot ledge in the 13 level, and that its gold-producing properties are magnificent. In fact, Mr. Mainhart assures us that the Omaha looks better now than it has ever looked heretofore.

ASSAY OF WYOMING ROCK.—Fair samples from the Wyoming ledge, located in Grass Valley township, were sent a few days ago to San Francisco for examination and assay. Returns from the assayer have been received, and the following result is given: Ore from the Powning ledge of the Wyoming mine. No gold visible in ore. The assay shows: Gold, \$599.96; silver, \$19.14; total, \$589.37 per ton. This is very healthy.

FEDERAL LOAN.—*Transcript*, Oct. 21: The history of the Federal Loan mine, just east of this city, is strongly illustrative of what well-directed pluck and energy can accomplish in the business of mining. Two years ago a company, of which the Vincent Bros. (John and Louis) and A. Wutke are the principal stockholders, began the development of the property in the face of difficulties that would have appalled weaker-hearted men. The location, though rich in promise because of discoveries made thereabout by former prospectors, who had worked but superficially, however, was isolated and difficult of access. The company to-day have a good wagon-road giving direct communication with the city. Their five-stamp mill, hoisting and pumping works, boarding house, office, etc., constitute one of the

best arranged and most complete plants on any mine in the county, and what is better than all else, the outflow of bullion is liberal and growing. Just at present a station is being cut at the 400-foot level and drifts will soon be started. The ledge in the bottom of the shaft is good 4 feet in thickness and 15 inches of it is so rich in sulphurets that as conservative a mining man as Hon. B. J. Watson, who was out there yesterday, said to the *Transcript* this morning: "I have never before seen anything so beautiful. It is a veritable jewelry shop and sparkles in the candle light like so many rare and radiant gems." Water is coming in very fast—which is a good sign—and a ten-inch pump, in addition to the two already used, is being put in. A cleanup has been made this week, after a 14-day run, and there is to show for it an 82-ounce bar, besides much more gold scraped from the front of the battery, and a large quantity of sulphurets saved by the two Fuses.

Placer.

THE GRAY EAGLE MINE.—*Herald*, Oct. 24: From what we learn of the outlook, the next important mining development in our county can be confidently expected from this property. There is no reason why as rich a mine as the Mayflower has proved itself to be will not soon be making golden returns for the pluck and energy of the men who have pushed it through the long period of development work. At the present time a slope is being driven down from the tunnel to find the bed of the channel. The flow of water is readily handled by the new steam pump, which is the largest ever taken onto the Forest Hill Divide. The steam for it is brought down from the surface, over 400 feet above where the work is being done in the mine. The arrangements for ventilation and drainage are complete, and everything points to the early tapping of the channel. The formations being passed through are similar to those found in the Mayflower, and confirm the opinions of experts that both mines are on the same channel. The striking of gold in this mine will locate and prove the value of some five miles of deep blue gravel channel, half of which, owing to the shape of the country, can only be worked through the Gray Eagle tunnel. The managers of the mine are considering the advisability of putting in an electric pumping and hoisting plant to replace the present steam pump. The water pumped from the mine will be used under 600-foot head to generate the electricity at a point in the North Fork canyon, a short mile from the mine, and ample power will be developed to do all the pumping, hoisting and drilling required in the mine, and even to run a stamp-mill if the gravel be found cemented, as at the Mayflower. The economy over the present steam plant for pumping and hoisting alone will be several hundred dollars a month, or sufficient to pay all the expenses of the change in six months running.

A RICH MINE NEAR ROCKLIN.—*Herald*, Oct. 24: Harlow Brothers & Co., who have been developing a gravel claim two or three miles east of Rocklin, under the superintendency of James Laird Sr., are reported as taking out the richest pay that has ever been found in that part of the country. So much encouraged are they, that they have put on eight-hour shifts and are working day and night; and are preparing to put in a Cox pan with a capacity of 100 tons a day in which to grind the gravel for the purpose of freeing the gold from the cement, a process which is necessary to get the full benefit of their very rich deposit. They have worked the channel already to the width of 100 feet, but have thus far not got to either rim.

THE GREEN MINE.—The Green quartz mine in the Ophir district has again fallen into the hands of F. X. Lavallee, an old miner of that district and one of its former owners. When Mr. Lavallee owned in this mine some years ago, he made money out of it. He calls it his first love in mining matters, and is as tickled as a man can be to get hold of it again. He says he has a company ready to take hold and start it up just as soon as they can get it. In a few weeks at most, the old Green, he declares, will be the scene of business.

Plumas.

ON GOOD ORE.—*Plumas Bulletin*: Good reports come from the Johnny Bull mine. The mill is running steadily on good ore. A. W. Whitney, superintendent of the Crescent mine, informs us that the sinking of the shaft will be completed in about six weeks. Good progress is now being made. The shaft completed, exploration work will begin.

Shasta.

IGO.—*Cor. Shasta Courier*, Oct. 24: There is quite a boom now taking place in our mines. Jno. Wright took another load of ore to Anderson for shipment lately. W. D. Bull is getting out more ore from his mine. All the arrastras on South Fork are running on average ore. W. R. Streeter has struck a good lead on South Fork. The Bell mine, at Sunny Hill, is regularly shipping good ore.

Sierra.

EXTENSION.—*Mt. Messenger*, Oct. 24: The entire force of men at work in the Extension mine, was laid off about the middle of last week, to put in a blower and to permit the putting in of new bents at the dump, and the raising of the track, etc. These repairs were completed by Tuesday of this week, and the full force put to work that evening.

CHANNEL FOUND.—Joseph Nipo was down from Bunker Hill, Friday. He reports Uncle Nick Berets has indeed found the channel for which he has been looking so long. It lies in a north-westerly direction from the old works. Some little time ago a raise was made and blue gravel found that was rich, eight dollars to the carload, but the bedrock pitched away. The main tunnel is being pushed to get into the channel. R. H. Judson, manager, was down from the Ante Up quartz mine Tuesday last. The company has prospects that encourages it, and will continue prospecting during the winter. Jas. McBride was over from St. Louis, last Monday, and reported times improving over there, and that he had never seen water so low in the creeks as at the present time.

Siskiyou.

SALMON RIVER MINES.—*Siskiyou Telegram*, Oct. 24: Jas. Nally of Sawyer's Bar was in the city for a few days this week, and paid a pleasant visit to the *Telegram*. Mr. Nally informs us that the mines in the Salmon river district are turning out better than for a number of years, although the most of the work is not done on a very extensive scale, as the owners are waiting till the wagon-road over the mountain is completed, thus enabling them to con-

vey machinery, etc., to their mines with greater facility and much less cost than at present. Daggett's mill was sent down this week for a short season, while the Gold Ball mine, as usual, is doing exceedingly well, also other mines working on extensions of the Gold Ball lead. Eveleth & Co. are also doing much better than usual. Taking it all in all, the Salmon country has a future much brighter at present than at any other time since its discovery.

QUICKSILVER.—*Yreka Journal*, Oct. 21: The Siskiyou Quicksilver Mining Co. on Siskiyou mountain has been obliged to tear down the furnaces recently built and rebuild them for finer ore, which requires more brick and larger furnaces. When the ledge was first opened, the superintendent supposed all the ore would be coarse, or consist of large chunks, as in most cinnabar chimneys, but finds that it is fine but rich. The new furnaces will be ready for the reduction of ore again in about a week or ten days. It was the intention to build a fine ore furnace afterward, but owing to lateness of season, and the fear of storms preventing the chances of burning brick and building furnaces, deemed it best to put up the coarse ore-furnaces first. With the construction of the new fine ore-furnaces, and probably retaining some of the coarse ore-furnaces, the company will be prepared to work both kinds of the ore successfully.

QUARTZ.—Allen Davis is still driving a tunnel to strike the quartz ledge on Willow Creek in the mountains west of Gazelle. He has reached a distance of about 54 feet in blasting through the slate rock, and expects to tap the ledge within ten feet more. The assays from the croppings, made by Bell Bros. at Redding and others, show that most of the quartz pays \$32.32 per ton, the smallest assay being \$10. This ledge is believed to be at least 30 feet wide, judging from its extent between walls at the croppings, and is likely to prove an extensive mine, with an unlimited amount of gold-bearing quartz to last for ages. The ledge runs from northeast to southwest, dipping toward the Humburg range in the vicinity of Greenhorn and Yreka. If this mine develops into rich mining property, the range of mountains between Scott and Shasta Valleys will prove as good a mining field as the ranges along the west side of Scott Valley, Yreka basin and the Klamath river region, where valuable quartz mines are now being worked with great success. Wm. A. Chamberlain has found croppings of a quartz ledge on the upper end of Greenhorn creek, at right side of the wagon-road, which prospects very rich, and may prove a valuable lode of good size on being tested by sinking down. Wherever quartz is found on Greenhorn, it generally prospects very rich, but seems to be in pockets, although there certainly must be extensive veins somewhere, either deep down or in the heart of the Humburg range extending along the west side of Yreka from Klamath river to Greenhorn and McAdams creeks.

BAR CLAIM.—The Bentz Bar claim, at Klamath river, near Honolulu, worked by Chinese, still continues to pay exceedingly rich, but the 16 Chinese interested refuse to divulge anything except to admit that the claim is paying dividends. A white miner at work across the river, watching them one day last week with an opera-glass, saw the sluices cleaned up three times on that day, thus showing that the gold must have been quite thick. He also saw the pans filled with an immense amount of the glittering dust, but could not form any idea of the value of that day's cleanup. The Phil Mott claim, below Honolulu, is also yielding rich returns for the work performed, and other companies in the vicinity are taking out great quantities of gold dust from bottoming up the bedrock of the ancient channel of the Klamath wherever found, the stream at present date being away from the ancient course in many localities. The Allen Bros. have the new hoisting machinery in operation at their quartz ledge in Quartz Valley, and will now be able to get out quartz in great abundance for crushing. These boys have one of the richest and most extensive quartz mines in Northern California, and are working it in the best manner by securing all the latest and most improved machinery for success.

Trinity.

EAST FORK MINES.—*Trinity Journal*, Oct. 24: R. N. Skinner, superintendent of the Enterprise mine, East Fork, was in town Thursday and informed us that they had struck on to rich rock on the Lone Jack, and that the strike recently made in the Enterprise is still showing up well, and the ledge getting larger as they run off on it. This has been the best paying property on East Fork, and the prospect is now that it will continue for many years to pay a handsome dividend. The lessees of the Yellowstone are getting out good ore and making a good profit on their crushings. The vein is not large, but large enough to admit of taking out the pay rock without handling much waste.

THE NEW MILL.—Wm. Berry, superintendent of the Globe mine, left Monday for the city. While there he will have a Huntington mill shipped, and an effort will be made to get it on the ground and put in running order this fall. J. N. McDonald has been employed to hew the timbers and erect the building for the mill, and the work was begun this week. McDonald has had experience in building mills, and we look for a good job, quickly done.

OPERATIONS COMMENCED.—We learn that operations are now fully under way at Horseshoe Bend, on the Lower Trinity, by a company composed mostly of residents of Humboldt county. It is proposed to run a tunnel through a high point, and divert the waters of the Trinity through it, and thus mine the river-bed for some distance.

YELLOW JACKET.—W. F. Junkans and Pietro Zulla were in town this week from Yellow Jacket. The arrastra on their property is completed, and as soon as water comes, they will be fully prepared to grind the rock and take out some hullion.

Tuolumne.

RAWHIDE RANCH.—*Union-Democrat*, Oct. 24: The work of development on the Rawhide Ranch mine, belonging to Messrs. Neville of Sonora and Ballard of San Francisco, speaks well for early and large profits. The mine is "en bonanza." It is another illustration of the fact that all the old mines of California—some of them long abandoned—are being reworked with successful results. The mine is under the able and energetic management of Mr. Neville.

PAY ORE.—The mill on the New Albany mine, the property of Dr. John Walker, is steadily at work on pay ore. The work recently done on the north end of the mine shows a large body of fine ore—some exceedingly rich. This is an important de-

velopment, and, taken in connection with the workings and pay ore at the central portion of the mine, the shaft being 832 feet deep from the surface and five levels driven from the shaft, proves the property to be of great value. The property consists of three locations—total length 400 feet. The water power is unsurpassed by any in the State. The Hubbard mine, on the Tuolumne river, now being developed under bond by Messrs. Hamilton & Corbin, of Sonora, promises to be a most valuable property. Its ores are of high quality and the vein is strong and well defined. The work of development of the Mary Ellen mine and the results of the mill now in operation are very satisfactory. The permanent and valuable character of the mine has been established. It is the property of A. B. Cruickshank. The mine is situated on the Tuolumne river. The sale of the Hunter mine, situated near the Buchanan mine, has been lately made to New York parties. The Bonita mine, located below the New Albany mine, is now the property of San Francisco parties, who propose to start work on it at an early day. Work will be resumed on the Seminole mine, near Summerville, very soon, orders having come to that effect from Mr. Bunnell, the owner, in San Francisco. Parties who know the mine well speak highly of its future. The Connelly mine, situated on the west bank of the canyon of the North Fork of the Tuolumne river, is showing well as the work of development proceeds. The results of the milling operations on the Stanley mine, near Jacksonville, have more than met the expectations of the owner and those holding bond from him. The ore bodies are of vast extent, the ore easily mined, being of a soft friable nature, and the cost of mining and milling by water power on a large scale will not exceed \$1 per ton, or less. The results in the ten-stamp mill as a working test showed a yield of \$4.50 per ton. These figures show large profits in the future. The McCormick Bros. have a good-looking piece of mining property situated on Wood creek, west of the San Geronimo mine, near this city. It is being worked by Geo. Richards and Blake Smith. The tunnel has been run for a distance of 100 feet, at which point the vein is seven feet wide. The sulphurets go \$75 per ton, and the ore yields 10 per cent sulphurets.

Yuba.

QUARTZ MINING.—Marsyville Democrat, Oct. 21: The Democrat is pleased to note the fact that there is a revival of interest in quartz mining in Yuba county. That there is to be rich and profitable ledges worked in the near future there is little doubt, judging by the latest developments in claims in the vicinity of Brownsville. There is also said to be very satisfactory prospects developing in the Brown's Valley district, where in early days a large amount of gold was taken out. From present prospects, it is safe to say that a large sum of money will be put into machinery to work Yuba county quartz mines in the next 12 months.

NEVADA.

Washoe District.

SAVAGE.—Virginia Chronicle, Oct. 22: During the week we have hoisted 522 cars of ore from the 500, 750, 950 and 1400 levels, and shipped to the Nevada mill 525 tons and milled 510 tons, average assay value as per battery samples of \$18.15 a ton. We have bullion on hand on October account amounting to \$15,706.75. The west drift from the new station, Potosi tunnel level, was advanced 29 feet, making its total length 559 feet. On the 950 level we are stopping on ore from the upraise. On the Suto tunnel level we are still working in the ledge from the main tunnel, preparatory to upraising and prospecting.

CROWN POINT.—The south lateral drift from the main west crosscut on the 300 level is now out a total distance of 184 feet. The face is in porphyry and bunches of low-grade quartz. Have stopped the drift temporarily and started No. 2 east crosscut from it, 80 feet south of No. 1. It is in 20 feet and the face is in a mixture of porphyry, quartz and clay, with considerable water running through it. Have stopped the west crosscut on the 600 level to permit the water encountered there last week to drain off.

KENTUCK.—Are now up 36 feet on the ore streak above the south drift from the north raise, 1000 level. There is no change to report over last week in its width or quality. The north drift from the Crown Point west crosscut, 500 level, has been advanced 12 feet, making its total length 57 feet.

HALE AND NORCROSS.—On the 1500 level, winze No. 2 was sunk 20 feet, making its total depth 140 feet below this level. The main incline was re-timbered 10 feet, making its total depth 248 feet. This level has now reached the Suto tunnel level, where we are now opening a large working station.

JUSTICE.—The south drift, 200 feet south of the shaft on the 490 level was cleaned out and re-timbered a distance of 62 feet during the past week; total distance 108 feet.

BELCHER.—The east crosscut No. 2 on the 300 level, in west ledge, has a total length of 127 feet; face in porphyry and low-grade quartz. Are opening out on the quartz encountered in the east crosscut on the 200 level and saving what we can for pay. The pay lies in spots through it, and the grade is therefore variable. Assays from it average from \$7 to \$30 per ton.

SCORPION.—The joint north drift, 900 level, has been advanced 17 feet, making its total length 561 feet; face in porphyry and clay. The water from the face has increased considerably and somewhat retards the progress of the drift.

SEG. BELCHER.—Have started a south drift in the quartz encountered in the west crosscut from the south lateral drift from the 500 level. It is out 22 feet and the face is in a mixture of porphyry and quartz giving low assays.

Galena District.

WOODBURY CONCENTRATOR.—Battle Mountain Central Nevada, Oct. 21: Five sacks of galena ore were tested lately in San Francisco on a new concentrator. The test was made by H. C. Reno, and the concentrator is the invention of a mining man named Woodbury. The results were so surprisingly successful that an order was immediately given to have a machine placed in position in the Bunker Hill mill, Galena. The concentrator has now been in operation about ten days, and has made a remarkable record. Mr. Woodbury was in Galena several days last week viewing his machine at work on Galena ore. It promises to revolutionize the

mining and milling industries of the camp, and already its benefit has been felt.

Pioche District.

FURNACE NOTES.—Pioche Record, Oct. 21: John Elvine has been appointed night foreman at the new smelters. The new assay office is rapidly nearing completion, and will be ready for occupancy in a few days. The new works at the smelters were lit up Saturday night by the electric light, which made everything as light as day. The new reservoir at the smelters is rapidly filling up with water. It has taken considerable time to get the ground saturated sufficiently to hold water.

COLORADO.

THE NEW LAMP.—Denver Republican, Oct. 21: Creede, the new mining camp in the San Juan country, seems to be in a very prosperous condition. Several excellent mines have been opened there, and the Denver & Rio Grande is now constructing a branch road to the town. It is one of the liveliest camps in the State, and the published accounts show that it presents many of the characteristics of a new mining town, like those that were seen during the days when the mountains were filled with prospectors, and much of Colorado was an unknown and unexplored country. The branch of the Rio Grande which is being built will doubtless be a profitable one to that company.

MONTANA.

ANACONDA AT WORK AGAIN.—Butte Inter-Mountain, Oct. 22: Mr. Daly says: The dispute with the railroad company about rates is over. Probably both companies got the worst of the fight, and both are equally glad that the end has come. Things will now go ahead as usual. Quite a number of men were put to work this morning, and more will be put on to-night. As soon as the slopes and tracks can be cleared, we shall have a full force of 1000 or 1200 men at work in the Anaconda and syndicate mines. In 36 hours we shall begin hoisting ore, and in about four days the Montana Union will be taking it to the smelter. Both the smelters will soon be in full blast, the same as they were before, with a full complement of men—probably 1400. "Have you any fuel on hand?" "Not a great deal at present, but to-morrow morning 40 carloads will start from Rock Springs, and that will be the size of the daily shipment from that point hereafter; within 12 days we shall be producing matte." At the Anaconda and Wake-Up-Jim hoists, the stars and stripes were unfurled to the breeze at an early hour, and from 7 to 9 o'clock a swarm of miners marched up the hill. There were over 1000 men in line at the Anaconda office. The mine superintendent gave it out that all the old employees of the company would be taken back first, and the names of others would be taken, and in case the old hands did not apply, preference would be given them. It was a glad scene, nothing like it having ever been presented in Butte. Men were put to work immediately, and a scene of life and activity that had not been known on the hill for many dreary months was presented.

NEW MEXICO.

A PRODUCER.—Silver City Enterprise, Oct. 27: The Mogollon country is making an enviable record as a producer of the precious metals. The country, though old, is comparatively new as a producer of the precious metals. The Enterprise has spoken frequently of this wonderful region, and has always maintained that machinery was all that was required to bring the country into prominence. We have had occasion to refer frequently to the two mines in question, the Maud S. and the Last Chance. Last week we noted the arrival of two bricks, and this week we are called upon to chronicle the receipt of two additional bars; the one from the Maud S. weighed 63½ pounds and is valued at \$1354, and the Last Chance comes to the front with 86 pounds, worth \$1621.

A BIG DEAL.—The Grand Central group of mines in Carpenter district, this county, have changed hands for the neat sum of \$1,000,000. This is the largest sale of mining property which has taken place in the Southwest for a number of years, and speaks volumes for the future of a heretofore comparatively unknown section. The success of this venture will in all probability be the means of booming the entire western slope of the Black Range country, and of opening up properties heretofore neglected. There is every reason to believe that this sale is but the precursor of others equally as large, which will follow in the near future. The property in question comprises the Alta, Washington, Grand Central and Central mines, all monster zinc-lead deposits carrying silver. Carpenter district is an extensive one, and the properties just sold comprise but a small fraction of the mineral wealth which is to be found within its limits. The recent sale will stimulate mine owners to renewed activity, and it would not surprise us to learn that within the next few months eight other large sales had been effected. Prospectors may now strike out for the hills on the western slope, confident in the knowledge that if they strike anything they can dispose of it.

UTAH.

PARK NOTES.—Record, Oct. 17: The new shaft house at the Lucky Bill is going up rapidly and will soon be completed. Sinking is going forward without interruption and the shaft is steadily growing in depth. Stock is still held firmly at good figures. Some remarkably fine ore is now being taken from the old stops in the Northland mine, and work is being vigorously prosecuted in the raise by White & MacDonald, who are driving it on a contract. Three shifts are being worked. The machinery for the Mears arrived this week and consists of 50-horse power boilers and a hoisting engine capable of sinking to a depth of 1000 feet. A new air compressor and much other machinery arrived for the Daly-West this week and was taken to the mine. Great advantage has been taken of the recent pleasant weather and the works are now nearly inclosed and the men have protection from the weather. The boiler room being erected is a permanent building and consequently everything connected with it is first class in every particular. The Daly-West is making a great stir this fall, but will make a bigger one next spring.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING OCT. 20, 1891.

461,729.—RAILWAY RAIL CHAIR-PLATE—P. Baggio, Oakland, Cal.

461,771.—WRENCH—J. O. Cottrell, Riverside, Cal.

461,751.—COUPLING—L. S. Goldman, Redlands, Cal.

461,480.—EXTENSION REVOLVER STOCK—W. L. & E. C. Kellar, Azusa, Cal.

461,615.—WHIFFLETREE CLIP AND HOOK—R. L. Kirby, Pomerooy, Wash.

461,483.—LOCOMOTIVE—J. B. Mahana, Free-water, Or.

461,763.—CAR FOR SINGLE RAILWAYS—J. B. Mahana, Free-water, Or.

461,764.—ELEVATED RAILWAY—J. B. Mahana, Free-water, Or.

461,802.—VAPOUR ENGINE—P. C. Sainsevain, San Jose, Cal.

461,451.—BOX LINING—A. Schilling, Oakland, Cal.

461,547.—PROPELLING WHEEL—J. W. Seivert, Medical Lake, Cal.

461,595.—CULTIVATOR—C. Sims, Los Olivos, Cal.

461,718.—BELL-RINGER—Slater & Barnes, Oakland, Cal.

461,513.—LUBRICANT—A. Sommer, Berkeley, Cal.

461,527.—CAR COUPLING—A. H. Weir, Los Angeles, Cal.

461,461.—STAMP-SELLING MACHINE—S. B. Whiteside, S. F.

461,725.—ENGINEER'S AIR BRAKE VALVE—J. T. Wilson, S. F.

The following brief list by telegraph, for Oct. 27, will appear more complete on receipt of mail advices: California.—Robert A. Hickok, Santa Ana, lamp stove; George W. McNeal, Oakland, electric railway; Anton and J. Michalitschke, San Francisco, handle wrapper for cigars; Robert Magler, San Francisco, truss; Theobald Scheibel, Santa Rosa, gate; Jasper S. Scott, San Jose, derrier fork attachment; John H. Southey, Stockton, rein guard; Washington—Remembrance L. Kirby, Pomerooy, running gear for vehicles; Angus J. McDonald, Blaine, household article; Martin Rosenbaum, Tacoma, combined extension show table and bedstead, Arizona.—Charles W. Blackburn, Tombstone, whiffletree hook.

NOTES.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ENGINEER'S AIR-BRAKE VALVE.—John Tyler Wilson, S. F. No. 461,725. Dated Oct. 20, 1891. A general and brief description of the usual construction and operation of the devices now in use will give a better understanding of the improvements covered by this patent. The engineer's brake and equalizing discharge valve of the ordinary type consists of a valve shell or body connected with the brake pipe and also with the main reservoir. It has within it a rotary valve provided with suitable ports, and said valve is operated by means of a handle. The valve body or shell contains other parts and devices which are unnecessary to describe, as they are the usual ones in these appliances that the invention relates to. There are several positions of the handle which have received distinctive names indicative of the operations to be performed. The first position is termed the "position for releasing the brake." The next is the position while running. The next is the position on lap. The next is the position for the application of the brake to the general train service. The final position is known as the "emergency stop," and is only used, as the name implies, when it is desired to obtain the most forcible applications of the brakes. These positions succeed one another, and are reached successively by the movement of the handle in the same direction.

Brakes are not only applied to the wheels of the cars and tender of the train, but are also applied to the driving-wheels of the locomotive. The former brakes are known as the "train service," while the latter are known as the "drive-wheel brakes." There are two ways in which they are arranged with relation to each other. One is to unite them, and in this form of connecting the brakes, whenever applied to the wheels of the train cars and tender, are also applied to the driving-wheels of the locomotive. This uniting of the brakes is found in practice to possess many disadvantages and is seldom used. One disadvantage is that the brakes must be very delicately handled to avoid a too forcible application of them to the driving-wheels, which would result in a sudden checking of the momentum, producing a shock. Another is the wear and tear on the tires of the driving-wheels, which is very great, especially on long grades, where the brakes have to be constantly applied for long distances. These disadvantages have resulted, therefore, in the adoption of another form of application, namely, the separate application of the train-service brakes and the drive-wheel brakes. This separate application requires a separate lever or handle for the operation of the driving-wheel brakes, and the disadvantage of this method is that the engineer is required to perform two distinct operations, namely, the operation of the handle of the train-service brakes and a separate operation of another handle to apply the brakes to the driving-wheels. This double operation is a severe strain upon the engineer's mind and is not likely to be performed under the very circumstances which are intended to call for its performance, namely, an emergency.

The object of the present improvement is to provide means by which the disadvantages of both the methods heretofore described are avoided, said means insuring the best results by the operation of a single handle having movements and stops precisely the same as are at present employed, applying the brakes for the train service only at the ordinary

brake-service stop and applying the brakes fully for the train-service and also the brakes for the driving-wheels of the locomotive at the emergency stop. Therefore, by the improvements, the brakes do not have to be so carefully manipulated, nor is there any wear and tear on the driving-wheels, as their brakes are only applied in cases of emergency, and finally, there are no separate operations to be performed by the engineer; but, on the contrary, the present and usual operation of a single handle is all that is required.

BELL-RINGING ATTACHMENT.—Wm. W. Slater and Harry C. Barnes, Oakland, No. 461,718. Dated Oct. 20, 1891. This is an electric attachment for ringing bells at railroad crossings or at other points where it is desirable to produce a signal or alarm; and it consists in the combination with the stationary bell, having a movable tongue or clapper, of a peculiarly constructed electro-magnet, with a direct connection between the magnet and the movable tongue. The object of the invention is to combine in an electro-magnet the advantageous points of an attracting pole and a solenoid for the purpose of actuating the movable clapper or tongue of the bell, whereby a pull of sufficient length is produced, with constantly increasing strength to the end of the stroke, and the tongue is made to strike the bell with great force just at the finish of the stroke.

Mining Share Market.

Mining shares the past week were lightly dealt in, notwithstanding the pool's efforts through cross orders to instill more life into the market so as to engineer for still lower prices. Even the chippers are gradually dropping out of the market. They are not doing much business except on orders. The downward movement of the market (10 per cent up and about 15 per cent down) is accepted as confirmatory of a report put out in last May at the time when Con. Virginia sold at \$20 a share, that the different pools had combined so as to help those controlling the middle mines to get the shares of the latter from outside holders. How well it has been done, ask any commission broker, for never within the history of the Comstock has the public held so few shares. It is said that the cry for help raised by the middle pool was due to the suit brought by the Mining Stock Association, through M. W. Fox in September of last year, against the Hale & Norcross Co.'s directors—those who have served at any time since 1886. Mr. Fox in his complaint claims that the shareholders in the mine were wronged, and asks for an accounting and the recovery of \$2,250,000 which he claims was misappropriated. In outside mining shares the Tuscaroras show more strength. The bodies were weaker through cross orders and an assessment on Bulwer. A pool is said to be concentrating these stocks. The Quijotas are lifeless.

The suit of Mr. W. Fox against the Hale and Norcross Co. (a corporation) and any individual director who has served at any time since 1886, begins to attract attention, and has considerable bearing on the mining share market. When the suit was first brought it was stigmatized as a blackmailing scheme, but as time passed and the defendants saw the systematic manner in which the plaintiff and his associates went to work to secure proofs to back their case, it became evident that it was no child's play. A stubborn fight was made against the plaintiffs having access to the books and records of the Carson Mint, but without avail. It is claimed that in examining these books and records very important information was secured of an official character, and that it is not confined to any one company. It is said also that in another way evidence was secured corroborating many of the reports of mismanagement, etc. Every step has been stubbornly fought, but the links, it is claimed, are so closely joined that it is not at all unlikely but the defendants in the suit will have to pay over a large sum of money to the shareholders in the mine. The strong bear moves, through assessments and other means, are accepted as confirmatory that the Middle pool after the stock, so that if judgment is rendered against the directors, very few outsiders will get any of the money owing to their having sold their stock.

Notwithstanding the stoppage of leaks at the mines, good news does get out, but then as the pool or pools break, through cross orders, the market outsiders think it is "all hosh," forgetting that this is the way insiders have of throwing discredit on favorable news when buying stock. The situation at the mines warrants much higher prices for the Comstock shares. The mines from one end of the lode to the other have been opened up on the various levels from the grass roots down to the Suto-tunnel level, and therefore they are in better shape than ever before for the extracting of the good to high grade ore to the west. Official and semi-official reports state that ore ranging from six to eight feet wide assays quite high—high enough to make the entire west lode workable at a good profit. In Con. Virginia fair progress is being made to develop for extracting the downward continuation of the ore from the levels above, out of which so many dividends were paid. Those in position to know claim that dividends will be resumed as soon as the company begins to extract the ore from the 1800 up to the 1600 foot level. From Hale and Norcross and also from Savage, the work under way is of a very encouraging character, and it will result in getting those two and also adjoining mines into better working condition for extracting at lessened cost the high-grade ore to the west. Important work is under way (but kept secret) in several of the Gold Hill mines. Before the favorable results are made public, another line of assessments will probably be levied to frighten outside shareholders into parting with their stock. The work in Ophir, Mexican, Union and Sierra Nevada bears close watching—the shares are being concentrated, and when better held by the pool, it is in order to spring good news on the public.

From all the outside mines more favorable news is being received, yet outside of the Tuscaroras the shares do not show it.

Mining shares opened this (Thursday) morning at lower prices, under a strong bear raid; after Call prices went still lower under outside selling, but toward the close they began to strengthen. The market is undoubtedly a buy at to-day's prices, and any one who buys and pays cash will make considerable money before the close of the year. The points out are for slightly lower prices before the big deal sets in.

MECHANICAL PROGRESS.

Influence of Zinc on Steel.

In connection with the bursting of a gun on board an English vessel, attention is being directed to the characteristics of certain qualities of steel. A correspondent of *Ironmonger* holds that steel is liable to be changed by the action of time, unaltered by any external, mechanical, or chemical influence. In support of his view that time alone appears to be sufficient to produce these changes he cites several examples of failures which have occurred within his own experience. At one of the engineering establishments in London a number of flat steel plates cracked spontaneously, with loud reports, several months after they had been received, and without any work having been subsequently done to them.

Some solid steel armor plates, supplied to a Continental navy, are said to have failed in the same way, and others from the same batch cracked on being tested by dropping. Numerous boiler plates have cracked after the boilers had been at work for years, and weeks after the steam pressure had been reduced and the water run out, and this, too, in spite of the fact that every boiler is tested to double its working pressure when new. Another instance is the cracking of hardened armor plating steel shells several months after they have been delivered to the authorities. This is attributed to the alter effects of the hardening process, but if these were independent of time the shells ought to crack during the operation or not at all.

At the May meeting of the British Iron and Steel Institute, Dr. Anderson, of Woolwich in a paper on the "Tests for steel used in the manufacture of artillery," dealt with the question in a very interesting manner, and the paper showed that the peculiarities mentioned are caused chiefly by the unequal tension of the metal, whether caused by the process of oil-hardening or in some other manner.

The metal may remain for a long time in this strained condition, and then a slight change of temperature, or some other relatively slight cause brings about a rupture. To obviate the risks thus incurred is a task not beyond the skill of metallurgists; but even after science has had its full play and chemistry its fullest functions it may be that the influence of time will deserve consideration. It is well known, for instance, that some cutlery firms prefer to keep their cast steel ingots two or three years before working them up, because experience has demonstrated that the steel is improved thereby.

MAKING TOOLS FROM SOFT STEEL.—It is asserted by the new, or Dalziel, process of treating steel, any of the ordinary steels of the usual lengths and shapes for making tools, punches and dies will, when treated, become soft as to effect a most material saving in the cost of making the desired tool; after having been softened and cut to the required form, the steel is handled in precisely the same way as any of the well-known sorts, and it is claimed that the process in no way affects the chemical composition of the metal, but so alters its physical structure as to impart the qualities mentioned. In proof of this, a piece of Jessup steel, which had been softened by this method, was made into a punch to cut a five-pointed star, seven-eighths of an inch in diameter and unusually sharp at the points, the result showing that in the making of this punch a saving of about 20 per cent, was effected in the cost, owing solely to the softness of the metal. After being cut it was tempered in the usual way in water, then forced through German silver 3/32 inches thick, also through wrought iron 3/16 inches thick, and as a final test was forced through metal which cut only a part of the star, thus giving an unbalanced pressure tending to heat the punch. It was given a series of tests in this way, not only unusual, but which would not be resorted to except under instructions to pass from one test to another more severe; in this case the tool came out at last as perfect as when it originally left the maker's hands.—*Carriage and Wagon Maker*.

NICKELIZED STEEL FOR SHIPS.—Writing from Halifax, Nova Scotia, to the *London Economist*, Mr. Peter Imrie predicts that Canada will eventually control the ship-building industry. It is now practically proved, he argues, that steel mixed with from three to five per cent of nickel is double the strength of ordinary steel, and that it does not corrode or take on barnacles, so that ships constructed of it will never require scraping. Moreover, as ships of nickelated steel may safely be built much lighter than ordinary steel ships, their engine power and consumption of coal may be safely reduced without diminution of speed. In short, nickelated steel seems bound to supersede ordinary steel, and probably also all other materials in present use in ship construction. Nickel has thus become a necessity, and the nation which is in a position to produce this material must necessarily control the ship-building trade. And, for the present at least, there is no known supply of nickel worth mentioning outside that of Canada. Canada possesses nickeliferous pyrites without limit. The entire lake region extending from Lake Superior to Labrador is rich in it. Experts declare that the Dominion can supply a million

tons of pure metal annually, if necessary, for an indefinite period. All the other sources of supply known in the world just now would not suffice to keep even a single first-class ship-building concern on the Clyde in full work.

FIRST USE OF IRON FOR STRUCTURAL PURPOSES.—Accustomed as we of to-day are to look upon iron as one of the most common as well as essential elements in the construction of almost everything, from the tiniest needle to the ponderous railroad bridge or magnificent building, there was a time when its use for structural purposes was looked upon with suspicion and distrust. There is standing to-day in England the first bridge ever built of this material, and it is in constant use notwithstanding the fact that it has stood the strain of travel for over 100 years. This old bridge spans a little river between Worcester and Shrewsbury, and was built in 1778. It is about 96 feet long and weighs 378 tons. Stephenson, the great engineer of his time, says of this bridge: "When we bear in mind that the manipulation of cast iron was at the time of its erection in its infancy, we cannot help but feel convinced that unblushing audacity alone could conceive of such an enterprise, and the intelligence with which the details are outlined and executed is equal to the boldness of the conception."

THE WAY TO SOFTEN STEEL.—A correspondent of the *Blacksmith* furnishes the following method for softening steel: Make two iron moulds a little larger than the piece of steel to be softened. Fill them with clay, imbed the steel in the clay and close the mould by winding a piece of wire around it to exclude the air. After heating the whole to a red heat, thrust the moulds among the coals, or in the ashes to cool. The steel will then be soft enough to be cut with a knife, as your correspondent desired. Another correspondent tells how to make a neat weld by heating the rim twice. That does very well, brother smith, but I begin my welding with the iron at a good welding heat, strike fast and hard and manage to turn out a fair job with only one heat.

METAL RAILWAY SLEEPERS IN RUSSIA.—An attempt is being made to introduce metal sleepers upon all the railways in Russia, says the *Ironmonger*. An experiment was made some time ago with sleepers of native make, when it was found that the only drawback was their cost. These experiments are now to be resumed upon an extensive scale, and contracts have accordingly been placed by the government with native makers for a large supply. If the trials should result in a general adoption of metal sleepers it is evident that an enormous impetus will be given to the Russian metallurgical industry, since it is estimated that there is in use 60,000,000 sleepers of wood that have to be renewed at the rate of about 13,000,000 yearly.

TO PREVENT SCREWS FROM BECOMING FIXED.—To prevent screws employed to join machinery from becoming fixed and difficult to remove from oxidation, the *Monitor Industrielle* recommends a mixture of oil and graphite, and says it will effectually prevent screws from becoming fixed, and protect them for years from rust. The mixture facilitates tightening up, and is an excellent lubricant, and reduces the friction of the screw in its socket. Carbon, of which graphite is largely composed, is the best known lubricant.

CASE HARDENING.—Prof. Elihu Thomson has recently devised a method of case-hardening iron or steel by means of the heat produced by the passage of an electric current. His process consists essentially in heating the object electrically, and then applying to the metal so heated a surrounding envelope—either gaseous, fluid or solid—for the purpose of changing or preventing change in the quality of the material, according to the special end to be attained.

WELDING.—To weld two rods of iron together so neatly that an expert cannot discover the weld, is done in the following manner. First chamfer the ends, then weld them together and then stave them up until they are considerably larger than the other part of the rods. After that take another weld and draw to a uniform size, and the job is neat and complete.

AN IMPROVED STAIR TREAD.—A new English pattern of stair tread is made of alternate strips of lead and steel, the lead furnishing foot-hold and the steel preventing wear. The lead is cast in grooves in a plate of steel, and it is claimed that this form of step has unusual durability, and will not wear smooth under heavy travel.

THE LATEST DEVICE in the way of a wood pulley for a shaft has only one arm to support the hub from the rim. This must give all the room that is wanted to remove a split wheel, and makes quite a contrast from the one that must have been built at a bicycle factory, for the spokes, as well as the rim, were composed of wire.

A NEW PROCESS for desulphurizing pig iron has been perfected by an inventor at Horde, Germany. Its practical operation is said to be fast winning it a reputation, and already a number of extensive works have applied for a right to use it. We are not informed as to the precise nature of the process.

SCIENTIFIC PROGRESS.

Electricity and Life.

Experiments that have a Suggestion Bearing Upon their Relation.

It seems to be a pretty well established fact, writes Edward P. Jackson in the *North American Review*, that electricity may be made at least a powerful stimulant to the growth of plants. May it not be more than a mere stimulant? May it not be an actual creator of life? Beans, rye, corn, oats, barley, peas, potatoes, sunflowers, clover and flax have all been experimented upon, in some cases with astonishing results. In one series of experiments the seeds were electrified before they were sown; in another, currents were maintained through the soil in which they were planted; and in still another, through the atmosphere immediately above the plants. In several instances the yield of fruit was enormously above the average, and in all, the growth was unusually luxuriant. Further experiments are in progress, and it is not unlikely that science is about to add another to her long series of beneficent triumphs, another refutation to the creaking philosophy of Malthus and his disciples.

The results of the experiments have, furthermore, a suggestive bearing upon the relation between electricity and that inscrutable something which we call life. If they do not prove them the same, they at least bring them nearer together than any phenomena which have preceded them. When, in the healing art, enfeebled vitality is restored, either wholly or in part, by the skillful application of electricity, nothing is positively demonstrated beyond mere healthful stimulation, the mere awakening of life which already lay dormant in the system, such as might possibly have followed the use of other remedial agents. But here it is not morbid life restored to normal conditions, not dormant life reawakened to action. It is apparently the actual development of vitality not pre-existent in the perfectly healthy and normal organisms under treatment. Electricity itself appears to be converted to vitality, as elsewhere it is converted to light, heat, and mechanical motion.

Whether life can thus not only be renewed but actually transfused into the veins, or rather the nerves of man, remains for physiological science to determine. It has already been shown that a living body is a species of thermoelectric battery, of which the ectoderm and the endoderm are the opposite poles; that the exhilarating effects of a cold plunge, for example, are due simply to the increase of potential from the reduced temperature of the "cold" electrode. But merely setting a battery into operation, or merely increasing its action, is not increasing its inherent voltage, which is what the recent experiments seem to have done for plants.

But do not heat and the active principle of light artificially intensified produce similar effects? The forcing of vegetable growth in hothouses is an old process, not unlike the one in question both in method and effect. According to the reports given, however, there is a very great difference in the results attained. If this be true, it would seem to indicate more strongly than ever that of all forms of natural force, electricity bears the closest relation to that mysterious form of it which we call life.

Latent Electricity.

A correspondent of the *Practical Mechanic* remarks as follows upon the question as to whether electricity in the atmosphere can be readily carried off by means of conductors and subsequently grounded.

"Judging from past experience and recent experiments it is evident that electrical currents sometimes are so powerful that the wires hardly seem to be able to carry the load, and that consequently more or less electricity 'escapes' and remains suspended in the atmosphere, which then has the same effect on the observer as exists previous to the occurrence of a heavy thunder storm."

That this condition of affairs can seriously effect low-tension currents has been satisfactorily proven, and efforts have been made to counteract these effects or rather prevent them by different means. In Paris, France, the subways in which the electric wires for lights, power, telephone, etc. are laid, it was found advisable to establish more ventilators than were at first proposed, in order to secure perfect ventilation and this fact alone serves to verify the theory that electricity in suspension existed to an extent which was damaging to the low tension currents carried by the unenclosed and unprotected wires.

Pyrotechnical displays have and are often witnessed between high and low-tension wires, when the atmosphere is heavily charged with electricity, and it has also been found that in the vicinity of water the air is purer than in other places. The conclusion therefore seems justified that water absorbs latent electricity quite readily.

In electric subways, of course it is not expedient to have water-pools since by virtue of evaporation the air would always be in a more or less moist condition, and this would counteract the gains as to purity. At any rate it is proven that electricity in its latent form can be collected or rather absorbed by proper substances, and if we take into consideration

that probably in the near future all electric wires, both high and low-tension, will have to go under ground, the field for inventors is open to design and construct a sub-way in which good ventilation, freedom from danger by induction of electric currents and readiness of access are the features."

RED STAINS ON COPPER AND BRASS.—Red stains often appear on copper and brass ware which sometimes cause considerable loss in the depreciation of such articles in store. Prof. Turner of Birmingham, England, has recently been studying into the cause of this phenomenon, with the view of devising some means to prevent its occurrence. The workmen usually ascribe these stains and spots to burning, sulphur, furnace dust and dirt, and are sure that the stains pass through the whole mass. Mr. Turner found none of these views correct and the stains confined to the surface; nodules were never observed. Finally, he evaporated water, salt water, pickle and dilute acids on the surface or wrote with such ingredients on the brass; then he did obtain stains, especially when chlorides had been used, but not with zinc chloride. The conclusion is that chlorides attack the zinc and liberate the copper; zinc chloride cannot do this. The stains are therefore caused by the water being allowed to dry on the material after washing upon completion of pickling. The brasses themselves Mr. Turner found very uniform. This trouble seems to be unusually annoying in the city of Birmingham, and the Professor says that as the water of that city is notoriously impregnated with chlorides, that fact accounts for the excess of the trouble in that locality.

STORM PREVENTION.—While some of the scientists in this country are busily engaged in devising ways and means to produce rain, their fellows on the other side of the Atlantic are equally busy in devising some means for preventing such phenomena. It appears that around Tarbes, a district in France, there have been for many years a number of destructive hail and rain storms which have caused a serious damage to the crops and vineyards. The storms are very sudden, and as they are always of a violent character, the peasants work under discouraging circumstances. Recently, the director of the observatory on the Pic du Midi thought of a means of averting these frequent disasters, and so he arranged a series of high poles on the hills about the unfortunate district, and these poles were surmounted with metallic caps and connected with wires. The director hopes in this way to cause a lessening of the electrical tension of the clouds, which he thinks is the cause of the storms. Both classes of experiments are being watched with interest by scientific men.

CLOUD PHOTOGRAPHY.—Many remarkable data of immense value in the preparation of weather forecasts have lately been secured by cloud photographs. The range of observations extended from clouds floating less than one and one-half miles high in air moving at seven miles an hour, to nine miles above the ground in gales blowing 65 miles an hour, while the surface wind was only a gentle breeze of five miles an hour.

THE PLANET MARS.—M. Flammarion, the French astronomer, has suggested that in Mars they are much more advanced, intelligently speaking, than we are ourselves, and that they may possibly have optical instruments which excel ours as much as the Lick telescope surpasses a piece of colored glass. Mars is an old planet, very cold now, but one which has passed through all its hot periods.

COMMON TURPENTINE AND LARCH TURPENTINE.—If a few drops of common turpentine in a test tube are covered with five parts ammonia of specific gravity 0.96, the turpentine forms a milky emulsion and soon gelatinizes. Larch, otherwise known as Venice turpentine, remains apparently unaffected, but if constantly stirred up it becomes a solid, colorless mass.

AN INDUSTRIOUS COLLECTOR.—G. W. Dunn, the California naturalist, has collected over 70,000 insects belonging to the horn-winged family, 5000 of the oricket tribe, about 4000 butterflies and numberless rare plants and animals. On his last trip through Lower California, he caught 200 insects of the Ciendela Sonimer in two hours, for which he received 25 cents each.

ELECTRIC PUSH BUTTONS FOR STREET CARS. The cars on the new cable railway in San Diego, Cal., have electric push-buttons instead of the troublesome dangling straps, with which to notify the gripman when to stop the car. Dry batteries are used for the electric bell service, and they are said to be less troublesome than replacing broken straps.

A NEW MOTOR, utilizing ordinary gas as well as petroleum, is announced compact in form, requiring little space and no expensive foundations or attendance. In a half-minute's time starting can be accomplished.

INSTANTANEOUS PHOTOGRAPHY has been used to record the movements of the lips in speaking, and by putting the photographs in a zoetrope a deaf mute can easily read the words.

LATE DEVELOPMENTS in electro-photography indicate that it may be possible to take photographs of views located many miles from the camera.

ELECTRICITY.

Transmission of Electrical Power.

What May Be Expected from Electricity in the Early Future.

The most interesting and important feature in recent electrical progress is the improved system of conveying electrical power from Lanfen on the river Neckar, in Germany, to the city of Frankfurt, a distance of 110 miles. This power is used at the great exhibition now in progress at Frankfurt, both for driving machinery and for lighting up the exhibition buildings. We have already, in our issue of last week, made reference to this matter; but as the interest in the enterprise grows deeper, with its continued success, and the vast possibilities which it opens up to the cheap production and ready and economical transmission of electrical power, we shall probably have frequent occasion to refer to it in the future.

As is well known, there is not, as yet, any known way for economically producing electrical power except through the intervention of some other agency, as steam or water power. Steam has heretofore been generally employed to generate the electricity, the latter being simply, used as a distributor or "belt," to carry the power from point to point where it may be needed. But this mode of transmission has heretofore been attended with a large percentage of loss, especially if the distance over which it has to be transmitted is very great. In some localities it has been convenient to employ water power instead of steam as a generator. Ordinarily water has a great advantage over steam in point of economy, but the percentage of loss has been so great that until very recently no attempt has been made to transmit the power generated more than four or five miles. Even that has been attended with a loss of 40 per cent or more. Moreover wires carrying such a strong current through a country have been exceedingly dangerous—a break in a wire by which the broken live end might come in contact with the ground would be sure death to any person or animal coming in contact with it.

The New Mode of Transmission Is Perfectly Free from Danger.

By the improved mode of transmission adopted between Lanfen and Frankfurt the element of danger from a broken wire is absolutely removed. Except by a carefully prepared diagram and quite a technical description, the manner in which this is done cannot be made intelligible to the reader. But it is done, and the operation of the whole apparatus of 300-horse power is made as safe as that of an ordinary telegraph battery and line. Moreover, the percentage of loss of power, which has heretofore reached 40 per cent or more in five miles, is reduced by this new method to only 25 per cent in 110 miles.

This powerful current is sent across the country, traversing one of the most populous regions of Europe, on those small copper wires, each about four millimeters in thickness, and strung along poles about 25 feet high. These wires are not covered with any insulating material, but are entirely bare. A portion of the current goes to the electric lighting apparatus, furnishing a current for 1200 incandescent lamps. The rest of the current goes to three motors when it takes the form of mechanical energy and drives machinery. This result, at last accounts, had not only been attained, but it had also been constantly maintained fully two weeks, and no doubt is entertained, but that it will be as permanent as any other power which can be introduced for similar work.

The Greatest Engineering Feat of the Age.

This may be considered one of the most important engineering enterprises ever successfully devised and carried out by man in any age of the world—and one promising greater benefits to human industry than has ever before been accomplished by any one step of progress.

We can conceive of only one greater possible step in the future—that of obtaining electricity direct from the combustion of coal. And even this has been promised us by that most successful and untiring inventor which the world has ever produced—Thomas A. Edison, who has never yet put his hand to anything without eventual success. When Edison says a thing is possible—especially in his own chosen field of research—it may set down as something to be implicitly depended upon.

Its Effect on California.

The announcement of the complete success of this undertaking is exerting a most beneficial effect upon capitalists in this State, many of whom have been for a long time waiting with intense interest the outcome of this German enterprise. It indicates what may be expected in the near future from the unlimited amount of water power now running to waste all along the foothills of the Sierra Nevada and the Sierra Madre which extend for a distance of some 500 miles along the Eastern border of our State. The experiment at Lanfen has proven that the power of those streams can be carried all through our great valleys and made far more economical than steam, not only for driving machinery, but for operating railroads as well. The people of Sacramento and vicinity; of Stockton and all the growing towns of the San Joaquin, and the upper Sacramento val-

leys, as well as those of the San Gabriel and San Bernardino valleys, and those still farther south are already agitating the value of their neighboring water falls, and laying plans for their early conversion into useful purposes connected with their various industrial needs and possibilities.

The achievement which has been reached by German engineers is equally possible in all the localities referred to. Turbines set in any of our mountain streams may generate an immense power at a trifling cost which may be economically carried to the towns and cities of the neighboring valley, distributed indefinitely, and made to do all the work of costly steam engines, which have to be fed by coal at a cost two and three times that demanded in the Eastern States. We are fully persuaded that the successful result reached in the experiment at Lanfen will mark a new era in mechanical science.

Electric Roads for Farmers.

One of the possible chief benefits to be derived from electric roads in the early future will probably inure direct to the farmers throughout the country. With the cheap production of electricity actually achieved in the Lanfen experiment alluded to in another column, to say nothing of the still greater reduction foreshadowed by Mr. Edison's repeated assertions that we shall soon be able to produce electricity direct from coal, the time will soon come—nay, is already at hand—when railroad propulsion by electricity will be so much cheaper than by the present use of steam that all our chief rural wagon-roads will be converted into electric railroads. Of course the farmer, more than any other class of producers, is benefited by railroads as they now exist in getting his products to market; but an equal advantage may also be gained by the use of minor roads in getting his produce from the farm to the various stations along the line of the great roads.

In regard to this matter, we would call attention to the following paragraph from a late number of the *Electrical Engineer*: "The use of electric roads for farms is destined to be enormous. At the present time, the state of the vast majority of our rural highways is such as to render transportation a frightful tax upon production. But nothing is easier than to track and wire these roads, furnish them with motor trucks upon which the farm wagons can be run fully loaded, and then turn on the current at stated intervals from the power-houses in the nearest town or at the nearest water-power. These electric roads will continue running through winter and spring months when the ordinary dirt roads are utterly impassable and when the multitude of draught horses kept by the farmers are simply eating their heads off in idleness. In 1880 there were 2,000,000 such horses on American farms. The bare possibility of getting promptly to market will stimulate the farmer to cultivate crops that now he dare not dream of. Moreover, the speed made will effect a most tremendous economy in the farmer's time.

Edison's Latest Invention.

Pertinent to the above, we would call attention to Edison's latest announced invention of a street-car motor, which is in direct line with the construction and operation of "Railroads for Farmers." Mr. Edison, in speaking of this invention to a newspaper reporter, said that he would move his cars with motors, but not by means of a storage battery. The current was to flow along the rails, and be picked up by the car as it moved. It could be picked up through two inches of mud. The current was absolutely safe from harm to any person coming in contact with the rails. His experiments were already completed, the invention was "a go," and a large company, after full investigation, had determined to introduce it on their road. In alluding to the control and picking up of the current, he remarked that it was a very difficult thing to work out; but he had finally perfected it and that it was "a very peculiar thing." In regard to economy, Mr. Edison assured his interviewer that the cost of running a car by his new system would not be more than one-third the cost of running a cable car. We give the report as we find it. It purports to come directly from Mr. Edison to a New York *World* interviewer. The claims set up by Mr. Edison appear to be almost too much to believe; but, with the strides which we actually know are being made in utilizing this new power, it would be quite as rash to say we do not believe as to say we do believe.

THE CROUCH SAFETY DYNAMO.—A large share of electrical inventions seems to be just now devoted to rendering electricity, in all its uses, safe from danger. We have already, in this issue of the PRESS, spoken of the safety devices being introduced by Mr. Edison, in regard to running electric cars, and now we learn that a safety electric-lighting system, invented by an Oregonian, is being introduced into Salem, Oregon. We copy from a contemporary as follows: "The Crouch-Houston Electrical and Manufacturing Co. of Eugene to-day filed articles of incorporation with the Secretary of State. The capital stock is \$1,000,000. The object of the corporation is to manufacture and sell the Crouch safety dynamo. This is the invention of a Eugene man—F. J. Crouch—and promises to revolutionize electric-lighting. Live wires are rendered harmless by this system.

GOOD HEALTH.

The Use of Pillows.

A pillow is a necessity; but care and judgment should be exercised in its use. No mere matter of habit is the use of a pillow. It has a physiological basis. We sleep, for the most part, on the side, and without a pillow the head would be uncomfortably and harmfully lower than the body. It will be remembered that Jacob, when fleeing from Esau, took a stone for a pillow. He needed something for the purpose, and nothing better than a stone presented itself. Such practices are common in Africa at the present day.

Some people rest the neck instead of the head on hard pillows. In Africa extraordinary headgears make this practice necessary, and many a civilized woman has been compelled by a somewhat similar culture to forego both the pillow and the recumbent posture. The consideration of the physiological reasons for pillows will suggest their proper thickness. They should merely bring the head to the normal level. Some pillows are much too thick. By bending the neck unduly they interfere with the outflow of the venous blood from the head. The pillow that just fills up the space above the shoulder best suits its end.

Again, pillows of feathers are objectionable. While they furnish the needed support for the head, they are too heating, as they have a remarkable capacity for holding and accumulating heat.

It should be remembered that more blood, and hence more heat, goes to the head than to any other part of the body. Head-heating pillows are against the wholesome maxim, "Keep the feet warm, but the head cool." There is nothing better than the hair pillows.

Further, the pillow is for the head, not for the shoulders. To rest the shoulders on the pillow defeats the very end for which it is used.

Finally, special care should be taken of infants in this matter. We have seen their heads sunk deep into the softest and thickest of pillows, and their faces, as a natural consequence, covered with great beads of perspiration. It is no wonder that children so treated die.—*Youth's Companion*.

TEA-EATING AND LEPROSY.—It was stated some time since in the *Examiner* of this city that the daughter of a well-known tea-broker of San Francisco was for some time a sufferer from that dread disease, the leprosy. She was in the habit of eating the tea without cooking, and it is thought she may have taken the disease into her system in that way. It is said that she has lately recovered, through immersion in oxygen gas diluted with air. She was also made to breathe the gas through a tube. These oxygen baths were kept up for about a month, when her skin became white like snow. This case goes on the record as the first one of leprosy that has been cured, and her attending doctor has been asked to explain his treatment to the County Medical Society. The permanency of the cure has yet to be established. It is thought that the oxygen burned to death the microbes of the leprosy. The doctor had endeavored to cure the leprosy by injecting the bacilli of cancer, which he claimed to be a deadly enemy to the bacilli of leprosy, but it did not prove successful. Possibly the oxygen cure may revolutionize the treatment of this terrible disease.

DO CATS CAUSE RINGWORM?—One of San Francisco's dailies recently published an article saying that ringworms were largely caused by cats. This troublesome skin disease usually attacks children, and the paper aforesaid claimed that it was largely caused by the fact that children were very fond of kittens, and that the little pets were very often covered with certain fungi or parasites which, when brought in contact with a human being's skin, act similar to poison oak, although the eruptions are of a different character. It was asserted by a certain physician that in every case when ringworm had made its appearance in his practice, there was always a cat or a kitten in the household. Very likely; and how many households can be found containing children where there are no cats or kittens? The fact adduced is hardly sufficient to condemn the feline pet, and we hardly think, until a better reason for their banishment can be adduced, the children will still continue to pet and fondle the dear little Maltese or Persian kitten.

PHOTOGRAPHY AND TUMORS.—It is said that the location of tumors on the brain can now be detected by instantaneous photography. A tumor on the brain causes violent spasms by pressing on a nerve center, and while the patient is in the midst of a spasmodic attack, he is photographed, the nerves affected determined by the contortions shown on the picture and the tumor located.

PETROLEUM AND SKIN DISEASE.—It has been noticed in France that those persons engaged in cleaning out the apparatus used in refining petroleum are subject to a skin disease resembling the cancer of chimney-sweepers.

The use of the electric light has been found to materially reduce the amount of illness in factories which had previously used gas or oil for lighting.

USEFUL INFORMATION.

TAKING A PLASTER CAST FROM LIFE is very unpleasant for the person operated upon, and especially when the face is molded, the pain is considerable. The face is first greased well with vaseline, the eyelashes and eyebrows being well buried in pomade or clay, and the small hairs well smoothed down. Whiskers, etc., should be well coated with clay. Quills are inserted in the nostrils for respiration. Then when the patient is lying in a recumbent position, the plaster is laid on. The patient must not move until the plaster is set. The plaster is mixed with warm water, as the plaster sets better than with cold water. When the cast is sufficiently set, it is removed. This is the painful part of the operation. A hand can be done by thrusting it in a basin of plaster, then placing it on a towel in a desired position. As the plaster sets, lay a strong thread on the wet plaster along the hand down the middle finger. A second thread may be laid from the wrist to the thumb. The object of these threads is to make divisions in the mold, and thus enable the hand to be withdrawn. Now lay on the plaster over the whole to a sufficient thickness. When it is nearly set (still soft and wet), take the ends of the threads, and by jerking them sharply through the plaster, sections are made in the mold. In a few minutes the plaster is hard, and the mold may be burst asunder at the divisions cut by the thread and the hand released. Fractures which will probably occur must be cemented carefully in their places, after they are dry, by a solution of shellac in alcohol.

IS QUARRYING MINING?—Mr. J. B. Atkinson, president of the Mining Institute of Scotland, in discussing in his presidential address the operations of mining, makes a distinction between quarrying and mining that is not generally observed, if, indeed, it is accepted. Mining he defines to be the extraction of mineral from the earth by underground operations and the placing of it on the surface; quarrying, the extraction of mineral from the earth by surface operation. We hardly think that this distinction can be maintained. There is open cut and underground working in mining, but both are mining. It is as much mining to mine iron ore in open cuts as in underground workings. There is not the least difference in the operations in one case from those in the other. The production of the ore in the quarry or in the underground workings is in either case mining.

THE FILAMENTS IN AN INCANDESCENT LAMP. It may not be generally known that the fine filaments over which the electric current runs in an incandescent lamp are, in many cases, made of split bamboo. The preparation of these filaments is quite an art in itself. Each operative is given a small bundle of bamboo splits of less than 1-16 inch cross-section, and these are drawn through a series of fine holes until shaven down to the required size. The bamboo is then quite pliable and easily bent into the peculiar twisted form as seen in the lamp. In this condition it is carbonized and is then ready for the lamp and electric current. Different companies use different methods. The Thomson-Houston use the bamboo filament; the Westinghouse, a prepared substance covered with lampblack.

WHAT IS A "LIMITED" TRAIN.—The following is given as the definition of a "limited" train: First, it is limited as to its time. Second, it is limited as to the number of cars and weight of train. Third, it is limited as to the class of cars. Fourth, it is limited as to the number and class of passengers permitted transportation thereon, this last limit being adopted so that every passenger may have ample accommodation and not be crowded or interfered with by other passengers. The fact that an additional fare is charged on a limited train, and further, that nothing but first-class tickets are accepted for passage, tends to limit the class of travel which is carried.

THE COMMERCE OF ENGLAND AND THE UNITED STATES COMPARED.—Since 1860 the commerce of England has increased less than six times, while that of the United States has increased more than six times. England's export trade has increased four times; that of the United States eight times. From the third producing power of the world we have risen to the first. Previous to 1860, our exports amounted to \$9,000,000,000; from 1860 to the present time they have amounted to \$14,000,000,000.

ALUMINUM BUTTONS.—A decided novelty in buttons are the aluminum. This metal is highly polished and made to resemble silver, and has the great advantage of holding its color. These buttons are great sellers but are now only made in small sizes and used mainly for children's clothing. They job at from \$1.50 to \$2 per gross. They look exceedingly nobby on navy blues, and, in fact, on all dark shades of boy's clothing.

WHERE THE SUN NEVER SETS.—It has long been the boast of Great Britain that here is the only realm on which the sun never sets. The boast is a false one, or has been such since the purchase by the United States of Alaska. When it is 6 o'clock P. M. at the westernmost of the Alaskan islands, it is 9:30 A. M. the next day on the eastern boundary of Maine.



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SAN FRANCISCO:

Saturday, October 31, 1891.

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Business Announcements.

[NEW THIS ISSUE.]

Tools, Hardware, Books, Etc.—Osborn & Alexander.
Assessment Notice—Gray Eagle Mining Co.
Pumping Engine for Sale—Room 20, 331 Pine St.

See Advertising Columns.

Passing Events.

The starting up of the Anaconda copper mine, Montana, is an important event for the section around the mine, as so many men are given employment. The differences with the railroad, which caused the close-down, have been arranged temporarily at least.

The sale of an important mine in New Mexico, for a large price, is an encouraging feature for that Territory. There are numbers of good properties in New Mexico that only need capital to make them productive. The presence of a few large companies will attract others.

The Trans-Mississippi Congress at Omaha has brought prominently to notice the difficulties miners have to contend with in working mines on railroad grants. It is a subject the Government should at once give attention to, otherwise much mineral land will go into the hands of railroad corporations.

R. P. KEATING, superintendent of the Hale and Norcross mine, was served with a subpoena to testify in the Hale and Norcross suit, but he left the State for Nevada, and the court has issued a bench warrant for his arrest.

River Dredging.

For some reason, we have not been successful in dredging the river beds for gold in California. Several dredges have been built and tried with no success. Several forms have been tested, suction pumps seeming to have been the favorite. This plan was even tried on the coast, near Gold Bluffs, on ocean bottom, but failed to bring up any gold. A great deal of money has been expended at different times in the northern rivers of this State, with no results. The dredges brought up dirt, gravel, etc., but little gold. One reason given, is the presence of boulders and rocks, and another, the presence of too much fine sand. At all events, the principal reason of failure has been too little gold. Over in the Carson river, Nev., for some years experimental dredging operations have been going on for net tailings and quicksilver, but as appears further on, no success of moment has been met with and the plans have had to be radically changed.

One strange feature of these failures is that the same kind of work has been successfully carried on elsewhere. In Australia numerous dredges are at work on river-beds and making money. One of the latest put at work in Victoria, Australia, is a dredge made in California. But other firms have done passably well there, while none have been successful here.

As to the Carson river, Nev., scheme, the Virginia Enterprise says: Some new plans have been formulated for the working of the tailings in the bed of the Carson river by the Rae Dredging Company. Mr. Rae was on the Comstock yesterday, and concluded a contract with A. J. McCone of the Fulton foundry for machinery for a mill to be erected at Dayton for the reduction of tailings. The first Rae dredge was provided with suction pipes for the purpose of raising the tailings from the bed of the river. The pipes became clogged, however, and the process proved impracticable. On the dredge now in use, scoops do this work. Another improvement is to be made also. The boat containing the dredging machinery is to be done away with. A railroad is to be built on the river, and the machinery placed upon a car which will run upon it. The tailings are first to be concentrated and then milled. The preparations now being made insure at least a fair test of the dredging proposition, and if results are satisfactory, a new industry of considerable proportions will have been established on the Carson river.

California and the World's Fair.

The California World's Fair Commission has, in the past few days been receiving communications from the various departments asking that California make application for space in the department buildings. As the secretary of the Commission cannot make any demand for space until the Californians who intend to exhibit have made known their intentions, it is essential that intending individual exhibitors make application to the local Commission immediately for the space which they require. Blank applications have been printed for this purpose and they will be sent to any one who asks for them. Applications from the various States for space in the department buildings have been coming in very rapidly, and for this reason the Commission urges exhibitors to lose no time. Some applications have already been received by the local Commission which have been attended to, but they are not very numerous.

As to a mining or mineral display, as far as we have learned, no concerted action has yet been taken by mining men. The State Mining Bureau will doubtless contribute typical specimens, etc, but no one is making a special collection, as has been done at previous World's Fairs.

More important, however, than a display of minerals would be a complete display of the various gold-saving appliances invented and manufactured in this State. In both quartz and gravel mining appliances, California has introduced a greater number than the other States combined. The question is, Who is to start in on such a collection? Individual inventors would be only interested in their own inventions. Some one should be suitably paid to arrange for such an exhibition, which would attract much more attention than any mere collection of ores and minerals.

Electric Drills for Mining.

The rapid increase during the past few years in the number and magnitude of applications of electric power transmission to commercial uses in this country has been due principally to three causes: First, the ability and enterprise of those who have been identified with the progress of electrical industries since electric illumination became an economic fact instead of a laboratory experiment; secondly, the readiness of the American people to adopt new and advanced methods as soon as their superiority had been fairly demonstrated; and, thirdly, the economy and flexibility of the apparatus employed, when properly designed and constructed and installed under suitable conditions.

There have been, however, some financial and engineering failures inseparable from such rapid development, the natural result of too implicit faith in electrical omnipotence. Still the pioneers of electrical inventions have received prompt and plentiful financial support, which has enabled them to inaugurate undertakings of exceptional magnitude.

Mr. H. C. Spaulding of Boston, Mass., read recently before the American Institute of Mining Engineers a paper on "Electric Power Transmission in Mining Operations," and we are indebted to him for the use of the engravings accompanying his paper. It is his object to present briefly some of the work already done toward the application of electrical apparatus to mining processes as well as to embody some practical suggestions and statements from those who have had personal experience in the operation of such apparatus.

Following the natural order of operations, let us consider drilling and cutting machinery in the first place. Fig. 1 of the engravings (See page 277.) shows the drill manufactured by the Diamond Prospecting Company of Chicago. This is designated by them as a Type "R" machine, nominal capacity 300 feet, and equipped with a motor of 3-horse power, rated capacity. The total weight of the machine, set up and running, is 1000 pounds, and the heaviest piece, when taken apart for shipment, weighs about 170 pounds. The machine is mounted on trucks fitting the gauge of the mine-track for easy handling, and can be taken apart in 15 minutes, and put up in a half-hour without difficulty.

The drill swivels so that bores can be put in at an angle, and can be operated in a space giving five feet in the line of the drill-rods.

The general arrangement of electrical and mechanical parts is sufficiently evident from the illustration, though the pump is hidden by the pedestal on the right. This is operated by the horizontal shaft driven by the bevel-gearing shown, and supplies a constant stream of water to the diamonds through hose connected with the top of the drill-tube. In a recent test on a granite boulder, hole 1½ inches in diameter, with slow speed, this drill cut 22 inches in 40 minutes. When set up in the mine and working on hard, compact limestone, it cut the rock at the rate of one inch per minute, not including stoppages for changing the rods.

For general prospecting purposes, this drill seems to meet satisfactorily the requirements of its special line of work.

The general principle of construction of most electro-dynamo machinery provides us with a rotary motion, which it is necessary to transform to a reciprocating in order to obtain drills of the Rand or Ingersoll type. Any such transformation, however, entails a considerable loss of power, and we are happily relieved of this necessity by recent inventions which are based on the general character of the solenoid.

Fig. 2 shows such a drill constructed under the patents of H. N. Marvin of Syracuse. Mr. C. J. Van Depoele of Lynn, Mass., was one of the first to appreciate the demand for this class of apparatus, as well as the possibilities of the principle involved, and a large factory has been built by the Thomson-Houston Co. especially devoted to drilling and pumping machinery of the reciprocating type.

A description of the general features of these drills, by Mr. Van Depoele, will be published later on in this series.

Many machines have been placed upon the market in recent years for making the undercut in soft-coal mining. Several of them have met with a certain degree of success in clean

and easily worked veins, steam or compressed air (generally the latter) being the operating force. Perhaps the most successful of these machines has been that manufactured by the Jeffreys Mining Machine Co., of Columbus, Ohio.

A machine embodying the boring principle is shown in fig. 3. A Thomson-Houston motor of a special type is used in this machine, current being supplied from the main-entry wires (which may also be used for lighting, haulage and pumping) by flexible wire-covered cables. The series of cutters (nine in number, each four inches wide) is so arranged as to cut close to the mill beside which the machine is placed, and within one-eighth of an inch of the level of the floor.

Although the weight of the apparatus complete is less than 1400 pounds, no clamping is needed, as the drills will "pull themselves into the coal," with only the friction of the machine behind them as it rests on the floor. The device for clearing the drills of coal dust is as simple as it is effective. It consists of a series of hinged scrapers hung from the under side of reciprocating bars, one of which is placed between every pair of drills, and which also operates an ingenious device for cutting out the triangular space left by the drills at top and bottom of the cut. The present type of machine makes a cut three feet wide, five feet deep and four inches thick in two minutes and a half, including withdrawal of the drills. With these figures in mind, the claim of 180 tons' capacity per day for these machines does not seem excessive. As the extreme height of the apparatus is only 23½ inches, it can be used in a vein of any thickness, and two small drums are so placed in the rear of each machine as to enable it to draw itself on to a truck which accompanies each machine, ready for moving into another chamber.

Mines and Railroad Grants.

One of the most important subjects of immediate interest to the mining community is that connected with the title to mining claims on railroad grants. It is perfectly plain that the Government never intended that the railroad companies should have any mining ground whatever within their grants, but they have manipulated matters so well that thousands of acres of mineral land have come into their possession, and what is worse, they are after more. The miners are put on the defensive and are having a hard fight against the powerful corporation influences.

The evils of the system are plainly recognized and have been referred to time and again in the PRESS. Montana has been the greatest sufferer of late and has made the hardest and most united fight in the contest; but the trouble has been felt in all the Western States and Territories where land grants have been made to railroads.

The Trans-Mississippi Congress, now in session at Omaha, has been considering various questions of importance to the people of the West, and has formulated resolutions calling the attention of the National Congress to certain points. The resolutions adopted with regard to mining and the railroads are as follows:

WHEREAS, The interest of mining creates and adds to the wealth of this country nearly \$100,000,000 annually of gold and silver alone, a product the scarcity of which means the depreciation of the values of the farms, the homes and all the real property of the country, as well as the wheat, the cotton and the corn produced by our toiling millions, and the abundance of which means increased comfort and prosperity to the great mass of our people; and

WHEREAS, There are millions of acres of the best gold and silver bearing mineral lands of the West on which there are thousands of mining properties, both patented and unpatented, within the limits of the grants to the Pacific railroads, and which are in imminent danger of becoming the property of these railroad companies; now, therefore be it

Resolved, That this body earnestly ask of Congress such legislation as will protect and foster our mining interests and forever prevent our mines and mineral lands bearing gold, silver, copper or lead from becoming the property of these corporations under their grants; and that this body or delegation in this convention from the Territories of Arizona, Utah, New Mexico and the States of California, Nevada, Colorado, Wyoming, Oregon, Idaho, South Dakota and Montana, which have a common interest in this subject, ask Congress to authorize the President to select a committee of seven members, who shall form a committee for the purpose of securing such united and efficient action as will save these mines and mineral lands to the people.

Ship-Building Plants.

San Diego is discussing a proposition to establish a steel ship-building yard at that port, and a \$600,000 subsidy is asked for to remove the present entire plant from Newcastle, Pa., to San Diego bay. A general committee referred the matter to a sub committee, who formulated and submitted, from the citizens, the following proposition:

We are satisfied that \$600,000 subsidy can be raised on the following conditions:

That the principal capitalists interested will visit this city and give satisfactory assurances of their financial ability to, and that they will, carry out the full proposition.

That the citizens will then undertake to raise the subsidy. Within 30 days after the completion of the subsidy, work shall begin and be carried on until the present entire plant and works at Newcastle, Pa., shall be removed to San Diego bay and erected and in operation, employing 250 hands, within seven months from date of contract or completion of subsidy. Said works when here and erected shall be of the appraised value of \$800,000, one appraiser each to be appointed by the parties and they to select a third; then 25 per cent shall be paid.

That within one year thereafter they will erect and put in operation on the bay a pipe and tube factory employing 250 men, a steel plant employing at least 350 men, a tin plate factory employing 300 men. And when each of these industries are established and the men employed, then 10 per cent of the subsidy shall be paid on each.

That within six months thereafter a rolling-mill and steel-rail works shall be established and 1000 men employed. Then 15 per cent of the subsidy shall be paid. And whenever ship-yards are established and from and steel ships being built and 8000 men are employed in the whole system of works, then the remaining 30 per cent shall be paid, provided it be done within one year after the last payment.

We also believe that a site or sites for the location of the plants can be obtained accessible to rail and ship.

This proposition, Mr. C. L. Habbie has telegraphed to his principals East.

This is a pretty large subsidy for San Diego to give to a single institution, but it is on the "installment plan," according to the proposition.

We already have, in San Francisco, a fine ship-building plant, established without any subsidy, but solely by the enterprise of the proprietors of the Union Iron Works. A number of prominent gentlemen visited these works a few days since and on the ways saw the hulls of four iron and steel vessels with the coast defense vessel, Monterey, afloat near by. Among those in course of construction is the big battle ship Oregon, and cruiser No. 6. The largest steam tug in the world is also being built at this yard. When the visitors saw five steel vessels being built at once, side by side; saw the Arago, the first vessel built by the Union Iron Works, undergoing repairs in the magnificent hydraulic dry dock, and went through the great shops and foundries, where ponderous machinery and huge boilers, weighing 80 tons, were being rapidly constructed, they were impressed with the fact that the Pacific Coast is already equal to any demand in the way of naval construction that may be made upon it.

It is to be hoped that San Diego will also establish a big ship yard, for there is plenty of room for more enterprises of this character on the shores of the Pacific.

Price of Quicksilver.

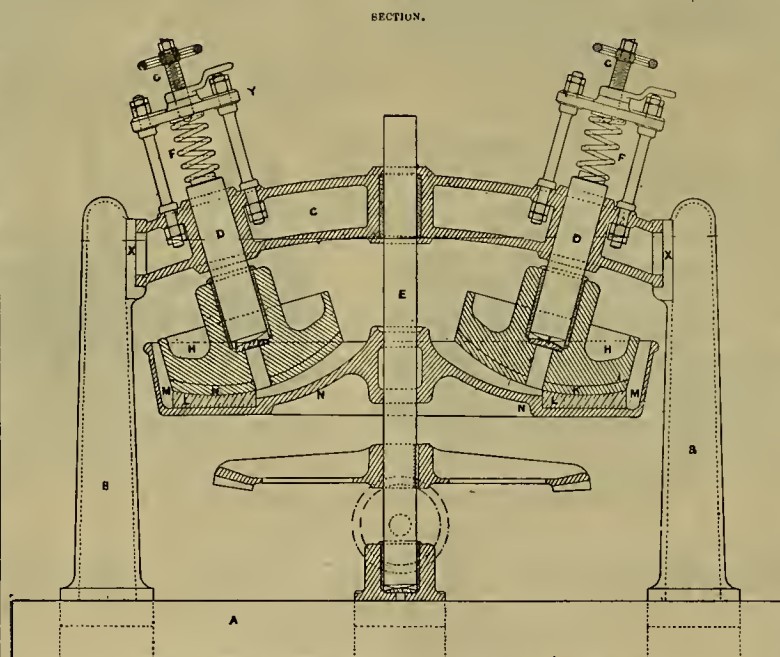
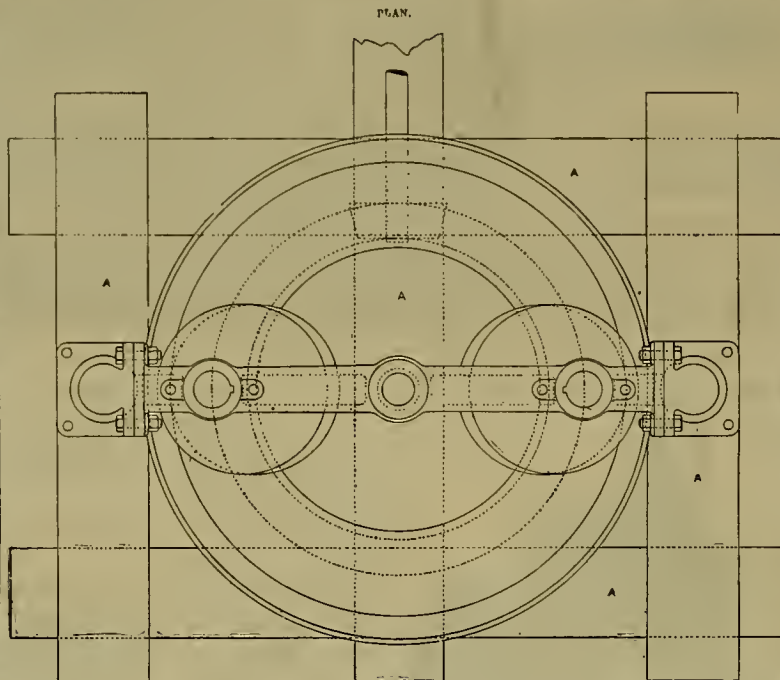
About three months ago mention was made in the commercial column of this paper that quotations for New Almaden quicksilver, had been withdrawn. The withdrawal of quotations was, at the time, stated to be due to a lessened output of quicksilver, a good demand and the certainty that better prices would soon obtain. At that time the range of prices was given at \$40 to \$41 a flask, hut to-day the market is quotable firm at \$47 to \$47.50 per flask for jobbing lots and \$50 a flask for carload lots, with the New Almaden Co. in the market as sellers. The advance is due to higher prices abroad brought about by a lessened output and a freer demand.

About all the quicksilver produced by the United States comes from California; Oregon, however, contributing a few flasks. There are no other producing mines in this country. There are not as many mines being worked here now as ten years ago, and the production of those that continue has not been as large as formerly. The richer bodies of ore in our productive mines have been worked out and the ore now being beneficiated has a low percentage of metal. The

demand for quicksilver does not decrease since mining operations are constantly widening, though the loss of quicksilver in milling operations is much less than formerly. These are some of the reasons for the recent advance in the price of this most useful substance.

ELECTRIC ROAD.—If no unforeseen delay intervene, the running of cars on the line of the San Francisco & San Mateo Railroad will begin on January 1st next. Track-laying over the entire route from the foot of Market street to Biden, in San Mateo county, is finished, and all switches and crossings are in place, except that

WIRES ON HOUSETOPS.—Judge Hebbard has rendered an important decision in the suit of David Henzel vs. Chief Sennell of the Fire Department. The action was to enjoin the department from removing electric wires from various buildings on which they had been erected by the plaintiff in violation of order 2301 of the Board of Supervisors. This order prohibits the suspension of electric wires over or upon the roofs and tops of buildings, and under it, it is the duty of the Chief Engineer of the Fire Department to remove all wires maintained contrary to these provisions. Henzel based his suit on a claim that the order was illegal and



BUTTER'S GRINDING AND AMALGAMATING PAN.

at Ocean View, which will be completed next week. The overhead wire, which will extend over the length of each track, is now being placed in position. The company has two sizes of cars, one style being 24 feet in length over all and the other 30 feet. The middle portion of each style is the same, the additional length being in the outside seat extensions. In appearance the cars resemble the new double-end cars on the California street cable line. At present the company has 30 cars, 15 of each size. Next spring as many more cars will be ordered.

DOUGHERTY'S MILL, located about five miles above Boulder Creek, on a branch of the South Pacific Coast railroad, was burned to the ground Saturday night. The loss of the mill, machinery and manufactured lumber is estimated at \$50,000.

FIVE new locomotives have been received by the Southern Pacific Company from the East. They are very heavy and are of the compound type. They weigh from 65 to 70 tons each.

invalid, because constituting an unreasonable exercise of the police power vested in the Board of Supervisors. Judge Hebbard held, however, that this point was not well taken. He therefore denied the injunction asked for, and gave judgment for the defendant, with costs.

KEYES PROPERTY SOLD.—A dispatch from Virginia, Nev., dated October 24th, says: The Keyes mine, in Seven-Mile canyon, was sold at sheriff's sale to day to satisfy a judgment of \$3055 obtained in the District Court for wages due miners and material furnished. The property was bid in by O. Loukey, the principal creditor, for the amount of the judgment. Several adjoining mining locations were included in the sale, among them the Mountain Brow, Silver Eagle, Virginia, Standard, Rosebud, Bonker Hill, Golden Eagle and Sugar Loaf, all situated in Six and Seven Mile canyons, this county, and claimed by Patrick J. Keyes, the locator.

THE Aldermen of Butte, Montana, have passed an ordinance prohibiting heap-roasting of ore in that city.

Double-Discharge Leffel Water Wheel.

(Continued from page 277)

Of its many meritorious features, the principal one is its double discharge, the water being divided equally at the outer and passing parallel with the shaft in opposite directions, discharging downward on each side of the wheel through curved pipes, without end thrust. The casing is made as narrow through the central portion as possible, in order to obtain the shortest distance between the journals, bringing them as near to the wheel as the discharge space will permit, securing a solid and substantial arrangement in the most condensed form.

The wheel is suitable for all purposes, especially where power is transmitted from a main horizontal line of shafting, which can be driven direct by one or more pulleys on the horizontal water-wheel shaft.

During the past year a number of applications of these wheels have been made to electric lighting, electric power, and other uses, directly from pulleys on the water-wheel shaft, to the pulleys on the dynamo, the saw arbor, or pumping machinery. In some instances pulleys are used on each side of the wheel, making a double pulley arrangement, and in some cases two or more pulleys have been applied on the same side.

The James Leffel & Co. will be pleased to furnish plans and estimates of the cost of entire water-power plants for all purposes, upon application to Springfield, Ohio, or 110 Liberty street, New York.

Butters' Patent Grinding and Amalgamating Pan.

This machine stands on an ordinary wooden bed-plate *A*, to which are bolted the cast-iron columns *B* that support the top framing, one column being required for each grinding roller employed, the most suitable arrangement being from three to five rollers, according to size of pan. The cast-iron beams *C*, for carrying roller spludges *D* and the vertical driving shaft *E*, are bolted to a flange on the columns *B*, shown at *x*. The compressing springs *F*, for giving the required pressure on the grinding rollers, are held in position by a crosshead and columns, as shown at *y*, and are so arranged as to be adjustable by means of the hand-wheel and screw *G*, a jam nut being provided to hold the screw in position when the desired pressure has been obtained. On the spludges *D* the grinding rollers *H* are placed, and revolve upon them, the spludges being stationary, held by a feather in the cast-iron beam *C*. To minimize wear, and to prevent dust getting into the bearing, a specially designed bush and footstep *I* are provided. The grinding face of the rollers is fitted with a specially hard facing piece *K*, so arranged as to be easily and expeditiously replaced in the event of wear through time. The cast-iron false bottom *L* is made specially hard, and is simply laid in position in the recess provided for it in the bottom of the pan on a bed of cement; the space *M* between the outside periphery of the false bottom and the side of pan acts as a quicksilver well. The pan *N* is keyed on to the vertical driving shaft and revolves with it, and thus driving by friction the grinding rollers at a high speed relative to the difference in the diameters of the pan and rollers.

The machine is also fitted with a tailings pan not shown, so arranged that the reduced materials flow through gratings in the side of the grinding pan *N* into it.

The special advantages claimed are speed of reduction and amalgamation, a five-foot pan with three rollers being capable of reducing half a ton of hard two-inch quartz per hour; no special foundation is required; it is easily driven and readily adapts itself to an arrangement of automatic feeding either by elevator or other feeders.

THE eleven lumber companies operating in the vicinity of Truckee cut 42,000,000 feet this summer. This is within 2,000,000 feet of the best cut on record. Trade has been quiet. The box trade, on the contrary, has been good.

A MINERS' HOSPITAL is to be established at Shasta and a building has been rented. It is proposed to run the business on the plan of the Railroad Hospital at Sacramento, by levying assessments among miners of the county.

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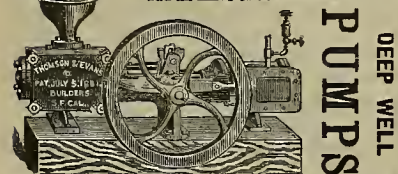
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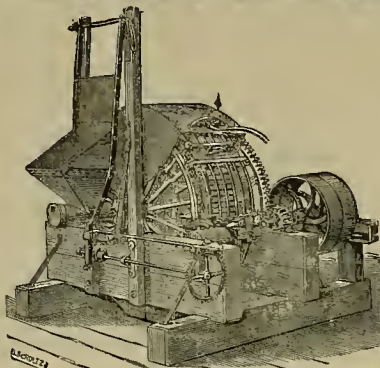
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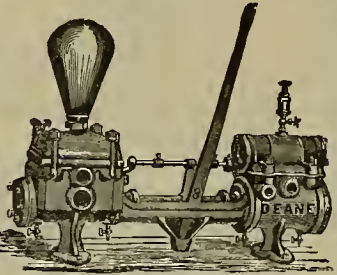
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T. C. HOCKING, Editor.

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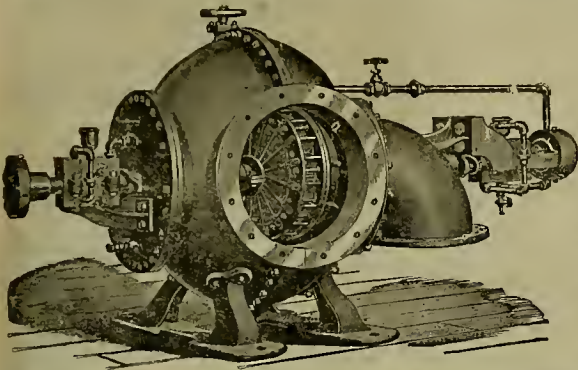
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Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.
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FRASER & CHALMERS, General Agents,
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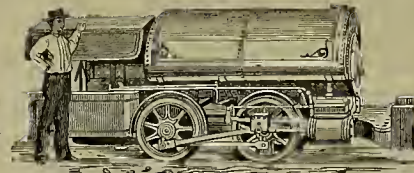
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Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennison's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
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Near First and Market Streets, S. F.

C. A. LUKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
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Plans and Specifications furnished for the most suitable Process for Working Ores.
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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.
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Mining Screens a specialty, from No. 1 to 15 (fine).
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Constantly on hand a full assortment of Manila Rope Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line etc., etc.

Extra sizes and lengths made to order on short notice, 611 & 613 Front St., San Francisco, Cal.

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L. PETERSON, MODEL MAKER,
253 Market St., N. E. cor. Front (up stairs), San Francisco
Experimental machinery and all kinds of models. Tin and brasswork. All communications strictly confidential.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 29, 1891.

General trade continues fairly active, with all branches participating. The money market is easy, with more funds offering for investment. Papers in the agricultural counties report more money offering than known for years past, causing a lower range of interest. Tax-collectors in the interior counties say that very few persons take advantage of the half-payment of taxes, for, as a rule, they have paid the total amount in one payment.

MEXICAN DOLLARS—The market is weak at around 77 cts.

QUICKSILVER—Receipts the past week aggregate 177 flasks, and the exports by sea 40 flasks of domestic and 100 flasks in transit to Mexican ports. The market is very strong at another advance. The movement is due to higher prices abroad and stronger holding here. In the local market, small orders are filled at \$47 to \$47.50, while for carload parcels \$50 is asked.

SILVER—Prices at home and also abroad continue to drop, and this, too, in the face of the statistical position of the metal favoring higher prices. The weak and easing market is accepted as proof positive of a strong speculative influence. The mines in Nevada and Arizona are turning out less than they did in 1890. The results of the State elections to be held in next week will probably have much to do with values in the immediate future. The fight in Ohio is being waged on the tariff and silver issues. The electors favoring silver are said to be working among legislators who favor the return of Senator Sherman to the U. S. Senate.

BORAX—No receipts are reported the past week, but a shipment of 274 cts was made by steamer to New York. The market is essentially unchanged.

LIME—Receipts the past week aggregate 3467 bbls. Free shipments are being made to the Hawaiian Islands. The home demand is fair. The low prices ruling for cement are against lime.

ANTIMONY—The market is fairly steady at the recent advance.

COPPER—The market is in a demoralized condition, consequent upon still lower prices abroad. English cables to *Iron Age* report as follows: "Consumers are still holding off, being influenced by the fact that large quantities of three months' futures bought last July are being liquidated. More or less pressure has also been brought to bear upon the market by certain dealers who appear to be bent upon keeping prices down until the sale of the Society des Metaux copper holdings, which is on the boards for Dec. 2d. Transactions in furnace material have been on a large scale, including 2500 tons Anaconda Matte for delivery up to April, 1892, terms not made public. European spot stocks are reported to have increased 1283 tons last month and the visible supply 597 tons. Chili charters for the fortnight were about 1000 tons."

TIN—Receipts the past week aggregate 500 boxes overland. The market is dull with concessions reported obtainable for both pig and plate. English advices report continued shipments of plate for this city. At New York pig has receded, closing heavy. Mail advices report the New York market as follows: London has furnished more or less variable reports from day to day, the net result of which would appear to be in buyers' favor, and the primary sources of supply have furnished a "bear" card in the shape of heavy shipments from the Straits, the latter amounting to no less than 1525 tons for the first half of the month. Pending developments upon the arrival of overland shipments, speculation is practically at a standstill, and large consumers, who evidently begin to gain some idea of the manipulation that is being indulged in, are buying with more than ordinary caution.

LEAD—The market, while weaker at the East, shows but little if any change with us. The Eastern market appears to be in a muddle condition so far as requirements are concerned. As yet, they do not appear to have been up to expectation.

IRON—The market is quoted higher for Oregon and Puget Sound, which is used for special purposes. Foreign iron is unchanged. The consumption continues free. *Iron Age*, Oct. 22d, reports that the demand for steel rails is increasing, which naturally inspires the belief that pig iron will soon begin to do better.

COAL—Receipts the past week aggregate as follows: Newcastle, N. S. W., 6786 tons; Greenock, 2250; Departure Bay, 5900; Tacoma, 4744; Nanaimo, 6843; Grimsby, 750; Glasgow, 2130; total, 26,403 tons. For spot and cargoes on passage the market continues weak, but for shipment, higher freights are against buyers. It is reported that in view of lessened shipments of foreign after next month, coast mines will have their output regulated so as to bring about better prices in the spring months.

Eastern Metal Markets.

By Telegraph.

New York, October 29.—The following are the closing prices the past week:

	Silver in London.	New York.	Copper.	Tin.
Thursday	44 9 15	96 1/2	11 90	4 25
Friday	44 1 15	95 1/2	11 60	4 25
Saturday	44 1 15	95 1/2	11 60	4 25
Sunday	44 1 15	95 1/2	11 60	4 25
Monday	44 1 15	95 1/2	11 60	4 25
Tuesday	44 1 15	95 1/2	11 60	4 25
Wednesday	44 1 15	95 1/2	11 60	4 25

Quicksilver is higher and very strong. Tin is weak and lower, as is copper. Lead is steadier at the decline. Pig iron is going into treacherous consumption.

A RICH TAKE—The Buzzard mine, owned by G. T. Salisbury and S. W. Handerson, situated near Inskip, this county, is making its owners rich. It gets better as they get into the ledge. Mr. Salisbury was down to-day and says that a few days ago they took \$700 from two feet of decomposed quartz and got it by means of mortars and pans. The quartz is thoroughly decomposed and is very rich.—Oroville *Mercury*.

MINING SHAREHOLDERS' DIRECTORY.

EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO. AMT.	LEVIED, DELINQ. AND SALE.	SECRETARY.
M. Co., Nevada.	40	Oct 5, Nov 11, Dec 2	L Osborn, 309 Montgomery
Cons M Co., California.	13	Sept 22, Nov 5, Dec 9	H D Walker, 309 Montgomery
Bruswick Cons M Co., California.	2	Sept 11, Oct 8, Nov 15	J Stadfield, Jr, 309 Montgomery
Buchanan M Co., California.	15	Oct 7, Nov 9, Nov 26	F J Sullivan, 121 Post
Bulwer Cons M Co., California.	1	Oct 28, Dec 4, Dec 31	L Osborn, 309 Montgomery
Butte King M Co., California.	2	Oct 21, Oct 31, Nov 18	W C Lewis, 723 Market
California & Arizona M Co., Arizona.	4	Sept 2, Nov 9, Nov 30	T E Jewell, 310 Pine
Chollar M Co., Nevada.	31	Oct 25, Nov 29, Dec 22	E Elliott, 309 Montgomery
Cons New York M Co., California.	3	Sept 25, Nov 1, Dec 23	O E Elliott, 309 Montgomery
Cons St. G. & H. M Co., California.	3	Sept 10, Oct 14, Oct 31	T Wetzel, 320 Sansome
Del Monte M Co., Nevada.	5	Sept 28, Nov 5, Nov 30	J W Pew, 310 Pine
Eureka Cons Drift M Co., California.	4	Oct 25, Nov 30, Dec 21	D M Kent, 330 Pine
East Best & Belcher Silver M Co., Nevada.	7	Oct 22, Nov 24, Dec 12	C H Mason, 331 Montgomery
Fall River Cons M Co., California.	8	Oct 20, Nov 25, Dec 2	J W Pew, 310 Pine
Garden Gravel M Co., California.	10	Sept 17, Oct 27, Nov 17	I N Thorne, 528 Montgomery
Gray Eagle M Co., California.	26	Oct 27, Nov 30, Dec 21	A W Barrows, 303 California
Hale & Norcross S M Co., Nevada.	93	Oct 15, Nov 24, Dec 15	A B Thompson, 309 Montgomery
Kentuck Cons M Co., Nevada.	2	Oct 26, Dec 1, Dec 23	J W Pew, 310 Pine
Keystone Cons M Co., California.	1	Sept 8, Oct 21, Nov 23	J H Isham, 310 Pine
Kingman M Co., Arizona.	1	Sept 30, Oct 12, Dec 1	T E Atkinson, 402 Montgomery
Mono G M Co., California.	31	Sept 17, Oct 27, Nov 30	H D Walker, 309 Montgomery
Mount Blanc Cons M Co., California.	8	Sept 18, Oct 20, Nov 7	A B Brady, Grass Valley
New El Dorado M Co., California.	8	Oct 2, Nov 5, Nov 27	J W Pew, 310 Pine
Occidental Cons M Co., Nevada.	8	Oct 19, Nov 23, Dec 15	A K Durbin, 309 Montgomery
Ophir M Co., Nevada.	57	Oct 2, Nov 4, Nov 24	E B Holmes, 309 Montgomery
Overman M Co., Nevada.	62	Sept 25, Oct 30, Nov 20	E D Edwards, 414 California
Peerless M Co., Arizona.	17	Sept 17, Oct 21, Nov 19	A Waterman, 309 Montgomery
Pennsylvania Gold M Co., California.	1	Oct 18, Nov 23, Dec 21	F W Seitz, Forest City
Sierra Nevada M Co., Nevada.	100	Oct 5, Nov 11, Dec 1	E S Parker, 309 Montgomery
Siaklyon Cons Quicksilver M Co., California.	1	Oct 9, Nov 12, Dec 4	E F Stone, 306 Pine
Silver King M Co., Arizona.	7	Oct 15, Sept 29, Oct 27	J W Pew, 310 Pine
Utah Cons M Co., Nevada.	13	Oct 15, Nov 1, Dec 18	A H Fish, 309 Montgomery
Yellow Jacket M Co., Nevada.	49	Aug 31, Oct 2, Nov 7	W H Blauvelt, Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
Confidence Silver M Co., Nevada.	Annual.	A S Groth, 414 California.	Nov 13
Great Western Quicksilver M Co.	Annual.	A Halsey, 328 Montgomery.	Nov 4
Mineral King M Co., Arizona.	Annual.	A Weiman, 419 California.	Nov 2
Occidental Cons M Co., Nevada.	Annual.	A K Durbin, 309 Montgomery.	Nov 16
Siskiyon Cons Quicksilver M Co., California.	Annual.	A K Durbin, 309 Montgomery.	Nov 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Champion M Co., California.	10	T Wetzel, 320 Sansome.	Aug 15
Gons Cal & Virginia M Co., Nevada.	50	A W Haves, 309 Montgomery.	Aug 17
Copita M Co.	30	E M Hall, 314 Montgomery.	Sept 10
Great Western Quicksilver M Co.	4	A Halsey, 328 Montgomery.	Oct 1
Idaho M Co., Grass Valley.	3	Grass Valley.	Aug 30
Mayflower Gravel M Co., California.	50	D M Kent, 330 Pine.	Oct 30
Pacific Coast Borax Co., California.	1	A H Hough, 230 Montgomery.	Oct 10
Standard Cons M Co., California.	10	J W Pew, 310 Pine.	Oct 26

San Francisco Metal and Coal Market.

THURSDAY, October 29, 1891.

ANTIMONY.	STEEL.
For lb. 14 @	English, lb. 16 @ 20
BORAX.	Canton tool. 9 @
Refined, in car lots 8 @	Bk Diamond tool 9 @ 9
Powdered, do. 8 @	Pick & Hammer. 8 @ 10
Concentrated, do. 7 @	Cochin. 7 @
All grades jobbing at advance.	Tool Calk. 4 @
COPPER.	TIN PLATE.
Bolt. 22 @	B. V. steel grade
Sheathing. 22 @	14x20, spot. \$ 75 @
10x20, jobbing. 15 @	Clarion. 14x20 5 @
Do, wholesale. (c) 14	Do roofing, 14x20 6 50 @
Fire Box Sheets. 22 @ 24	Do, do, 20x28. 13 00 @
IRON.	COAL.
Bar, base. 3 @ 34	Pig iron, spot, lb. @ 21 1/2
Norway, base. 4 @ 54	Irregular, coal 1 @
Spot, base. 4 @ 54	Spot from yard—PER TON.
Eglington. 24 @ 00	Wellington. 87 50
Glenbrook. 25 @ 00	Gretta. 8 00
Am. Soft, No. 1. 25 @ 00	Clarion. 8 00
Oregon Pig. 30 @ 00	Namding. 7 00
Langdon. 30 @ 00	Gilman. 7 00
Puget Sound. 30 @ 00	Seattle. 7 00
Clay Lane White. 23 @ 00	Opes Bay. 5 00
Shotta, No. 1. 25 @ 00	Channel. 9 50
Langdon. 30 @ 00	Egg, hard. 14 00
Thorncliffe. 25 @ 00	Cumberland, in sacks. 14 00
Gartsherr. 30 @ 00	Do, bulk. 13 00
Barrow. 30 @ 00	Wall and. 9 00
Do, bulk. 30 @ 00	Scottish Split. 7 00 @
CHROME IRON ORE.	LEAD.
Per ton. 10 00 @	Bryano. 8 50
Do, bulk. 10 00 @	West Hartley. 8 00
LEAD.	TO LOAD—PER TON.
Pig. 4 @	Australia. 87 1/2 @
Sheet. 5 @	Liverpool Steam. 7 00 @
Pipe. 6 @	Scotch Split. 7 00 @
Do, spot. 6 @	Cardiff. 7 25 @
(Discount 10% on 500 bags.)	Lehigh Lump. 13 00 @
Drop, 3 @	Cumberland. 10 00 @
Drop, 3 @	Egg, hard. @ 11 00
Buck, 3 @	West Hartley. @ 7 50
Chilled, do. 2 30 @	Do, bulk. @ 7 50
QUICKSILVER.	COKE.
By the tank. 47 @ 00	English, 1 ton. 89 @ 00 11 00
Flasks, old. 40 @ 50	Do, spot, in bulk. 10 @ 15 00

Sales at San Francisco Stock Exchange.

THURSDAY, October 29, 9:30 A. M.			
50 Alpha Con.....	45c	100 Iowa.....	25c
150 Andes.....	35c	100 Justice.....	40c
350 Babel.....	25c	100 Mexican.....	10c
100 Best & Belcher.....	2.50	100 Nevada Queen.....	40c
300 Bodie.....	50c	100 Ophir.....	2.70
50 Bullion.....	1.15	800 Overman.....	1.25
250 Calodora.....	35c	100 Savage.....	1.80
230 Con Cal & Va.....	4.80	250 See Belcher.....	60c
100 Con New York.....	30c	120 Sierra Nevada, 1 00 @ 1 65	1.60
100 Crown Point.....	1.15	50 Union Con.....	2.00
300 Exchequer.....	45c	650 Utah.....	40c
450 Hale & Norcross.....	35c	450 Yellow Jacket.....	1.45

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 1, San Francisco:

SAN FRANCISCO WATCH AND JEWELRY MFG CO., Oct. 25. Capital stock, \$50,000. Directors—L. Kullner, H. Kullner, S. Wagner, L. Green, M. Kullner.

BREYFOGLE M. & M. CO., Oct. 26. Capital stock, \$10,000,000. Directors—Geo. Montgomery, M. L. Templeton, John W. Pearson, G. H. Rose and J. A. Thompson.

SAN FRANCISCO RANIE FIBER SILK MFG CO., Oct. 26. Capital stock, \$1,000,000. Directors—S. H. Slaughter, J. J. Scoville, P. T. Hollings, R. M. Wood and Geo. F. Weeks.

AMERICAN ALUMINUM CO., Oct. 26. Capital stock, \$100,000. Directors—Geo. R. Tuttle, J. W. Stewart, Geo. L. Brown and F. Fletcher.

CALIFORNIA FIREWORKS CO., Oct. 26. Capital stock, \$100,000. Directors—F. L. Wooster, Ellis Wooster, H. P. Sonntag, J. Metcalfe and Herman Shainwald.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
F. K. MERRITT—San Francisco.
T. A. ASTIN—Pine Bluff, Cal.
Geo. WILSON—Sacramento Co.
J. H. CROSSMAN—Perris, Cal.
CRABNEY A. DAYTON—San Lucas, Cal.
G. R. GILL—Cambria, Cal.
Wm. T. HEALD—Cloverdale.
MRS. GERTRUDE DECKER—Fillmore, Cal.
ROBERT H. ASHES—E. Cajon, Cal.
N. E. KESLEY—Santa Clara County.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (ostling one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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TOOLS AND HARDWARE.

WORKSHOP MACHINES,

Operated by Foot and Steam Power.

Novelties, New Tools and all Recent Inventions.

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Technical and Scientific Books,

STANDARD AND PRACTICAL BOOKS

In Every Department of Industrial Science

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Ships upon advances to smelting works in Boston

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Twenty-one years' experience in Shipping Ores and

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Solicits Consignments of Copper Produce and Manage-

ment of Mining Matters.

All business conducted on Cash Basis.

Purchases and shipment of Mining Supplies a SPECIALTY.

Sales of Developed Copper Mines undertaken.

Business Manager of UNION COPPER MINE, Copper-

opolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

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GOLD, SILVER, LEAD, COPPER ORES AND FUR-

nace Products a Specialty in Assaying. Five years

practical experience. Moderate salary expected. References

address COPPER, care MINING AND SCIENTIFIC

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SPOT CASH

A remarkably fine first

class Piano.

with stool and scarf, for \$298.50 spot cash, f. o. b.

The best and cheapest Piano, at the most for the

money ever offered to the public. Other Pianos

are sold on installments, exchanged or rented

by us, but not this one. Five years guarantee.

Call and see it or send for a circular. Also one

still lower—\$238.00.

A. L. BANCROFT & CO.

Now at 303 Sutter St., S. F.

FOR SALE CHEAP.

ONE COMPOUND, DUPLEX, WORTHINGTON

DEEP MINING

Pumping Engine

(CONDENSING).

Capacity, 1,000,000 gallons daily, steam smd, 18x29,

plungers, 9x13-inch stroke; nearly new. For further

particulars, apply to Room 20, 331 Pine St., San Francisco.

KEYSTONE CONSOLIDATED MINING COMPANY.

Notice of Change of Office and Principal Place of

Business.—Notice is hereby given that, with the consent

in writing of the holders of more than two-thirds of the Capital

(Stock) of the Keystone Consolidated Mining Company (a

Corporation), the office and principal place of business of

said Corporation has been ordered to be, and on and after

November 1st, 1891, will be changed from Room 40 to Rooms

43 and 45, No. 310 Pine Street, City and County of San

Francisco, State of California. Dated October 7, 1891.

M. J. McDONALD, President.

J. H. ISHAM, Secretary.

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Assessment Notices.

CALIFORNIA AND ARIZONA MINING COMPANY.
Location of principal place of business, 330 Pine Street, San Francisco, California. Location of works, Mohave County, Territory of Arizona.
Notice is hereby given that at a meeting of the Board of Directors held on the 26th day of September, 1891, an assessment (No. 4) of Ten Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, 330 Pine Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 5th day of November, 1891, will be delinquent and will be advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
T. E. JEWELL, Secretary.
Office, 330 Pine Street, San Francisco, California.

NEW EL DORADO GOLD MINING COMPANY.

Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.
Notice is hereby given, that at a meeting of the Board of Directors held on the 2d day of October, 1891, an assessment, No. 3, of Five (5) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 5th day of November, 1891, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on FRIDAY, the 27th day of November, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
J. W. FEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

GRAY EAGLE MINING COMPANY.

Location of principal place of business, San Francisco, California. Location of works, Placer County, California.
Notice is hereby given, that at a meeting of the Board of Directors held on the 27th day of October, 1891, an assessment, No. 26, of Four (4) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 30th day of November, 1891, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 3rd day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

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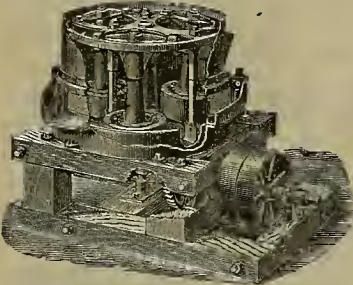
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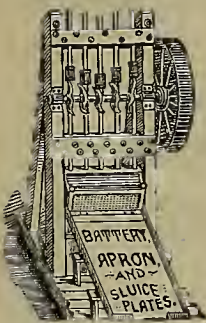
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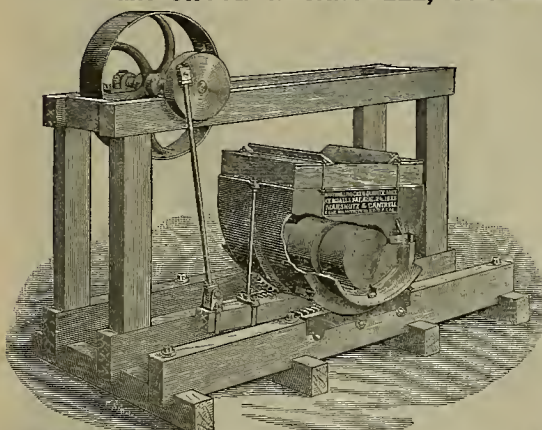
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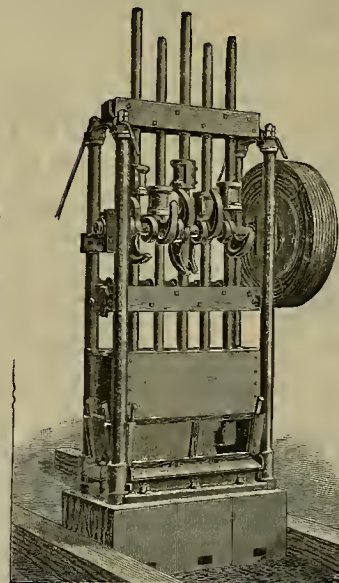
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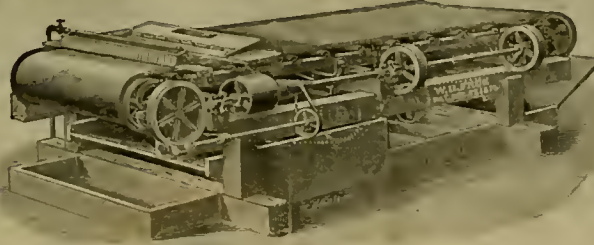
OVER 3000 IN ACTUAL USE.

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We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

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For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880;

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Price of Plain Belt Frue Vanner, \$575, f. o. b.

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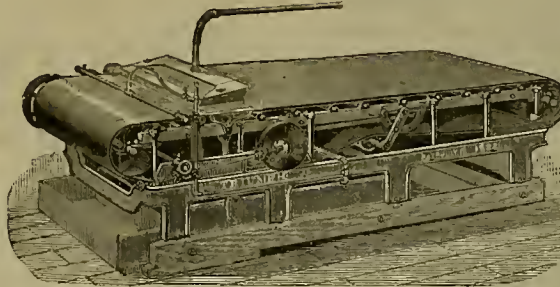
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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs"; for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.



Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - \$550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.

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Original Empire Mill and Mining Company,
Principal Office, 461 California St., cor. Sansone, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.
GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

Signed] Sup't North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 1300 IN USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

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It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

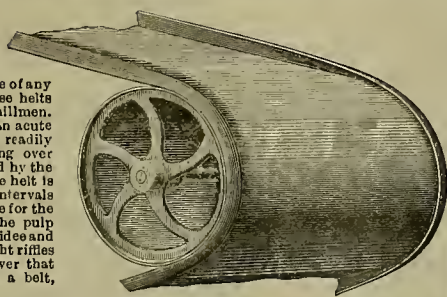
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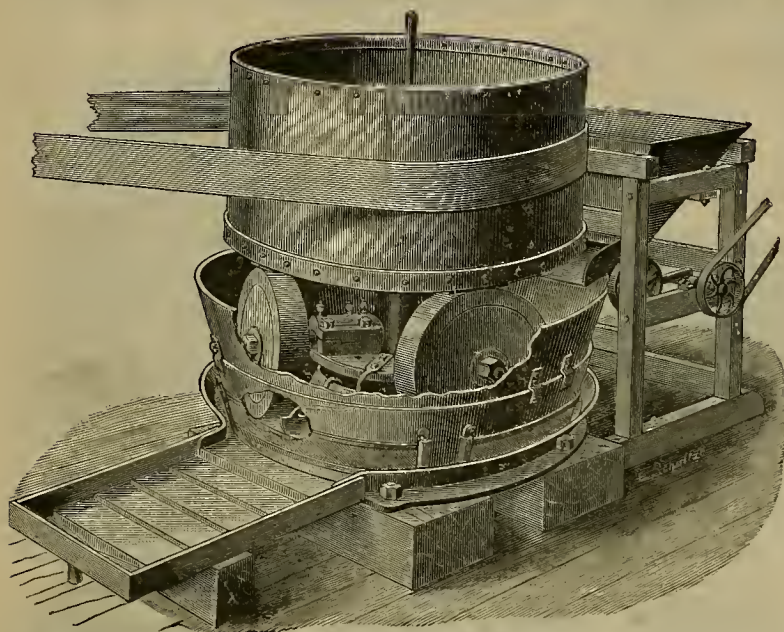
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- Three (3) Frue Concentrators.

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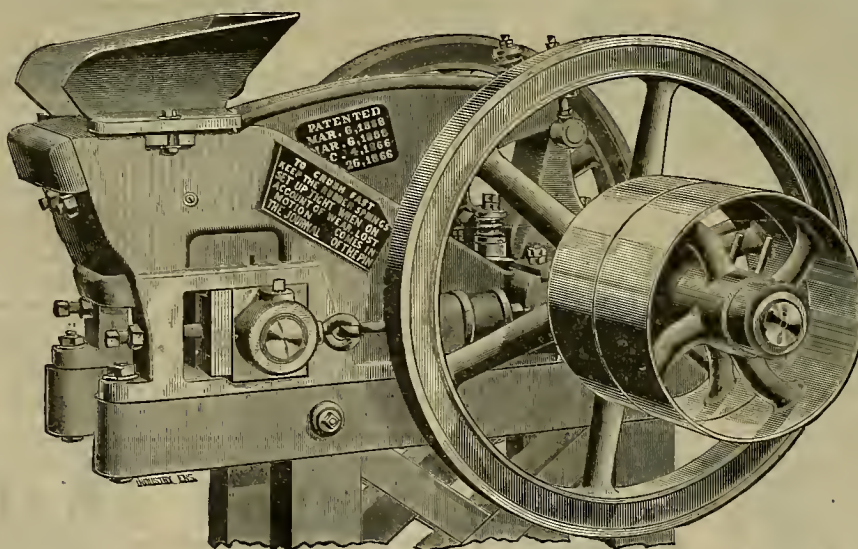
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Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

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Agent for HOSKINS'

HYDRO-CARBON ASSAY FURNACES.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 19.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 7, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Electric Mining Machinery.

In continuing this subject from last week's PRESS, other ones are presented from Mr. Spaulding's paper before the American Institute of Mining Engineers. In the opinion of many practical coal miners, the principle of the rotary drill has many points of superiority in undercutting machines, and the accompanying cut shows the result of considerable experimenting and outlay in this direction by the Hercules Mining Co. of Pittsburg, Pa. A series of drills is operated by a Tesla alternating motor, the power being transmitted by a belt, as shown, and the current being supplied to the motor by three armored cables. When in operation the cutter is clamped on the rails parallel with the face of the coal, being shifted along this track after each cut, ready for another. Compressible springs are wound upon each drill-rod, and serve as conveyors for the coal dust cut out by the drills.

After boring or drilling in ore or coal, it must be hauled out of the mine, or from one point to another under the surface. To W. M. Schlesinger is due the honor of constructing the first electric locomotive strictly for mining purposes in the United States. This was of 35-horse power rated capacity and was put in by the Lykens Valley Coal Co., Pa. A series of iron rails were joined together to form a conductor for the current, which, after passing through the motor, completed its circuit to the generator by the track rails, which were connected also by copper wires.

A locomotive of 40-horse power capacity has been in operation at the Hillside Coal Co.'s Erie Colliery near Scranton, Pa., a description of which shows fairly the conditions to be ful-

filled by this class of apparatus in the anthracite coal regions of Eastern Pennsylvania.

The locomotive shown in the illustration embraces many new features in motor construction and general design, and under practical test has shown that it is particularly adapted to the work required of it. It is built for a three-foot gauge and is of the following dimensions: Length over all, nine feet seven inches; width, five feet three inches; and height, five feet six inches. This last dimension can be considerably reduced by placing the rheostat at one end instead of on top, as has been done in the present instance. The weight of the locomotive is 10,500 pounds, to which 1800 pounds has been added to increase traction. The motor employed is of the type "G" railway motor of 40-horse power.

A novel trolley-arm is used, which requires no attention when the motor is reversed. Its construction is such that a wide variation in the position of the conductor is permissible, a range of three feet six inches being easily covered, while the meeting of an



ELECTRIC MINE LOCOMOTIVE FOR UNDERGROUND USE.

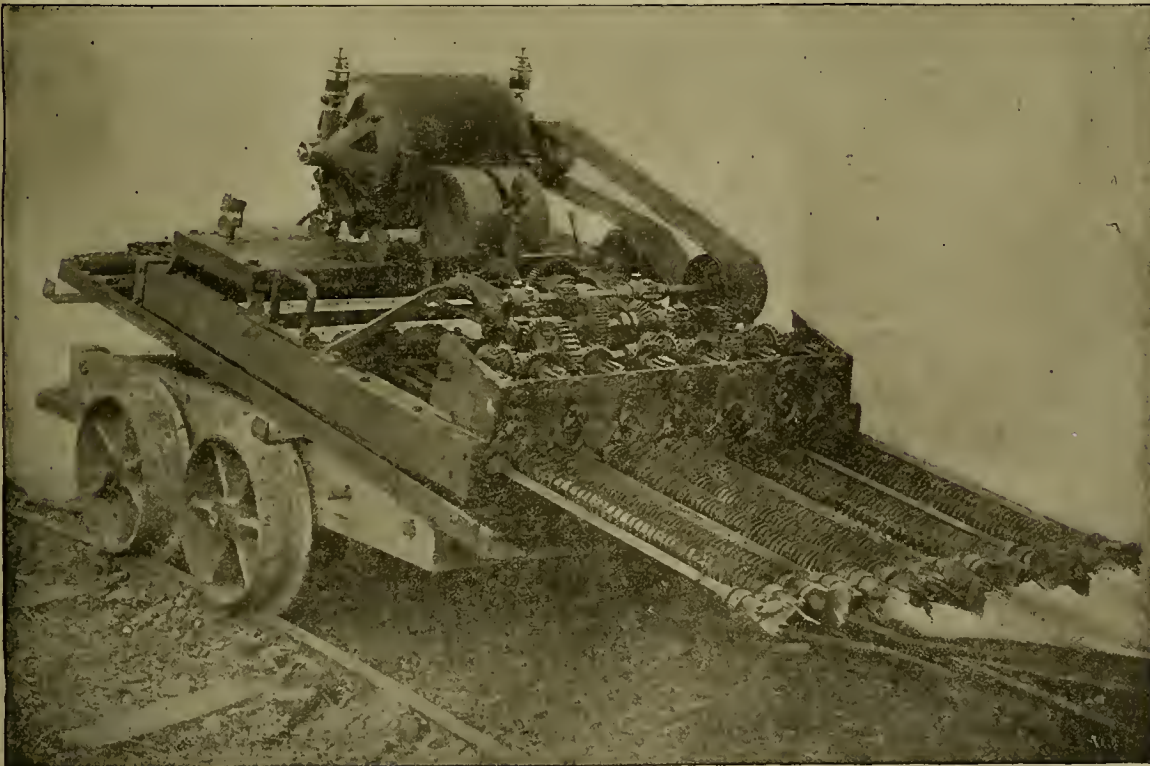
obstruction simply causes the trolley-arm to fall by the side of the car without resulting in any damage. From the trolley-wheel, the current passes along the arm to the fuse-boxes,

then through the rheostat and motor to the rail.

The locomotive is run by one man, who is assisted by a boy in making up trains and turning the switches. It displaces seven mules and three drivers.

FROM FORTY-MILE CREEK.—This creek is 1600 miles up the Yukon river, in Alaska, and a number of miners have returned from there recently. Twenty-five men came out this trip and 125 remain. In the diggings it is from 4 to 30 feet to bedrock. The season lasts but six months, and all the miners worked steadily in order to make the most of it. As a rule, they did very well. The party here will go back in the spring. Meantime, they say they are going to get thawed out at some of the California hot springs. There is a band of about 200 Indians of the Stick tribe in the Forty-Mile district, and some of the miners have taken wives from the band. They are snowed up a good deal of the time, but those that are ambitious pile wood on the snow, melt it and the frozen ground down, and then sink holes and prospect. In the time they have at their disposal in winter, they can sink enough holes to find good ground somewhere. The largest nugget taken out this year was one of 14 ounces. The biggest single cleanup from sluice boxes made by ten men was \$1460. The dust averages about \$17 to the ounce.

ONYX.—From general reports, onyx is getting to be almost too common for anything. It is being mined in Colorado so cheaply that it could be used for building purposes. Great quarries of it have been opened up in Missouri and Arkansas, while Arizona will soon be supplying the Western market. It is doubtful if any mineral in many years has undergone such radical changes in value in such a short time.



ELECTRIC COAL CUTTER OF THE HERCULES MINING COMPANY.

A Salt Mine.

A correspondent of the *Bulletin* writing from La Paz, Lower Cal., says:

The wheels of progress have not revolved as rapidly in this section of Mexico as in other portions of the civilized world. The main reason for this lagging propensity is to be found in the absence of such lubricating influences as energy and capital, of which, up to the present time, there has been "a long-felt want." Still, we are not hopelessly behind, as evidences of late go to prove.

The pearl fisheries, for instance—one of our main industries—through the recent infusion of fresh capital and some of your "home-made" energy, are yielding a much greater product, although, like the dutiful subjects of Persia's Shah, they are hounded with a heavy civil list. But what I desire to speak of at this time, more especially, is the sale, just effected, of what is known to some of your readers as Las Salinas, one of Nature's most remarkable laboratories, found nestling among the hills on the island of Carmen, near the western shore of the Gulf of Cortez, midway between this port and Gnuaymas. The purchasers are understood to be the Atchison, Topeka and Santa Fe Railroad Co., whose network of railways, extending from Gnuaymas, near by, to the main centers of population throughout the United States, will enable them, if the so-called McKinley tariff should give place to some one of its rivals to drop salt like the "gentle dews of heaven" or the manna of ancient days over the whole of Uncle Sam's dominions. They must have thought the political signs of the times portentous, and that it would be an act of wisdom to take time by the forelock, as it were, and as good Republicans asseuage the bitterness of defeat, should it come, by the addition, from Nature's storehouse, of a few millions of lucre, and with an eye single, at least partially, to business to make the island of Carmen a sort of southwestern terminus.

The transfer is certainly important, in view of future possibilities, and nothing but the barrier of duties can prevent its resulting in one of the most remarkable operations of modern times.

The amount of salt on the island cannot be even approximately calculated until it becomes known just where the bottom is. It is said that efforts have been made to sound the saline mass by shafts sunk near the middle. These, after passing through pure chloride of sodium, in uniform crystal, lying in regular strata, ended in salt. Each stratum is understood to represent nature's annual product, with the lines of division remarkably well defined. At nearly all times there is water on the surface, varying in depth, as the process of disintegration takes place, from one inch to two feet, and even three feet at rare intervals.

Whence comes all this water, which is heavily charged with saline matter, is so far an unsolved problem, although it is naturally supposed to come from the sea, distant at the nearest point nearly three-quarters of a mile. The land on all sides is hard, dry and mountainous, except to the southward, where it is perhaps 20 feet above the level of the gulf. On the side of the lowest land and nearest approach by water there is a well-protected bay, in which good anchorage has been found for vessels of large tonnage. Those seeking cargo are reached by a wharf and tramway leading directly from the "salinas," or lake, as it is sometimes called, because of the water usually seen on the surface. The cost of loading such vessels after the new owners have completed their arrangements will not exceed 25 cents per ton, while the expense of conveying the salt thence to the company's cars at the port of Gnuaymas may be brought under \$1 a ton. The tide, which is of excellent quality and believed to be fully equal to the Liverpool variety, will then be on their own ground and can be transferred to United States soil in almost unlimited quantities at prices likely to defy competition, and, as the supply seems inexhaustible, what may the new owners not be able to do when the barriers are down and they can pass the border unchallenged? How all your small salt producers will be forced to the wall, or into profanity, when they find themselves under their iron hoof of one of the biggest of modern trusts. On the other hand, should Uncle Sam stand by his portcullis, they may have to content themselves with small profits, since the duty on foreign salt is now with them a grave impediment.

The whole western coast of Mexico, for a great many years, has obtained its supplies of salt at Carmen Island, amounting to thousands of tons yearly. Still there has been no depletion, as Nature keeps constant watch and fills all spaces to the brim with just as good an article, while every hour of sun adds to the deposit. All the water that appears so mysteriously on the surface vaporizes and the residuum remains as solid crystals. A fresh supply of water then appears, and under the hand of Nature, passes through a similar process.

The effect of all this is apparent, but the cause or source seems to be one of those things, as Dunderberg would say, that "no fellow can find out."

This so-called lake is nearly circular in form, with a circumference, or more properly, periphery, measuring over four miles, indicating, as will be seen, an immense deposit and making the price now paid—understood to be \$300,000 in gold and bonds at market value—appear almost nominal.

Women in Mining.

The exigencies of frontier life have drawn many women before now into what have always been considered peculiarly masculine pursuits, and not often the new existence has developed talents of which no man need feel ashamed. There was many such cases in California in early days—cases where the man had tried and failed and the woman had picked up the unfinished task and succeeded. In these later days, however, it is somewhat singular to see a woman going out in the wilderness, where many men would fear to venture, and roughing it with the hardest of them. The following tale is taken from the *Tacoma Call*:

To look at her, one would not suppose that Mrs. Emily Knight of Tacoma was the kind of woman who would face and have experienced all the hardships of a miner's life, going far beyond the pale of civilization, away from all refining influences, among mountain fastnesses and previously untraveled regions, where many men would fear to go and it would appear impossible for a woman to venture, and push forward with indomitable courage, until she at last reached the goal and the El Dorado of her hopes; yet such is what this lady has accomplished.

Mrs. Knight has a refined appearance and is well preserved, not having passed the zenith of life. When enjoying the benefits of society and civilization she dresses modestly, yet becomingly; but what is particularly noticeable about her is the resolute lines of her mouth and chin and the determination in the glance of her eyes.

The lady arrived last evening from North Yakima, where the entire population of the town has gone wild over the energy and pluck that she has displayed. North Yakima is the point from which Mrs. Knight starts to her mining properties in the Gold Hill district, about ten miles east of Mount Tacoma, and 62 miles from North Yakima.

For over a year Mrs. Knight has been aware of the existence of extensive mineral deposits in the Gold Hill district, but it was not until recently that she finally decided to bond the 17 claims in the district, comparatively close to each other, for \$50,000. She has now returned from her properties and decided to take up the bond and make the necessary improvements for taking out ore. Even during her absence Mrs. Knight declares she cannot afford to lose any time in the work of development, and has a cook and three shifts of men engaged steadily in improving the Blue Bell, her most promising prospect. Upon her return, which will be in a few days, she will take with her enough provisions for the winter and work her claims without interruption until next spring.

At a recent meeting of the County Commissioners, Mrs. Knight appeared before the Board and explained the necessity and advantages of the construction of a wagon road from that city to the Gold Hill district. The Commissioners then decided to build a road to the district by way of the Naches valley. A telephone is also to be built to the mines mentioned, Mrs. Knight furnishing the poles.

The different prospects owned by Mrs. Knight on the Gold Hill district are situated in a broad deep gulch, and there is a separate vein to nearly every claim, and, in some cases, these veins can be traced 4000 feet. The ore carries both gold and silver, and runs from \$170 to \$281 to the ton. The veins lie south-east and northwest, in a solid formation, and are fissure veins. The Blue Bell, Emma and Union seem to be the most promising prospects. The Blue Bell is the only one being developed at present.

When seen in E. F. Russell & Co.'s office to-day and questioned about her experiences and prospects, Mrs. Knight said:

"Why do I follow this kind of life? Because I like it. There is a certain amount of fascination in mining and dealing in mines that particularly appeals to me. Think, one engaged in such a pursuit may be rich to-morrow, although comparatively poor to-day! But experience and hardship is necessary in most cases to make such a vocation a success. This is not my first venture in mining. I am familiar with the mineral deposits of Nova Scotia as well as those of both New and Old Mexico. I have visited other mineral localities, and been more or less successful."

Mrs. Knight was born in Lancashire, England, but has lived in this country some years, principally during her residence in the East, at Boston, where her daughter now resides. She has traveled all over the United States; was in the San Diego real estate boom, and made considerable money before the crash came, then shrewdly refused to invest there. She has resided until this last mining venture, for two years in Seattle, making more money in real estate and business enterprises. She seems to be in perfect health.

When Mrs. Knight starts out on her next trip, she will wear a fine suit of buckskin clothing of the regulation hunter's style. In going through the gorges and ravines, and fording the swiftly flowing creeks, a woman's clothing would be sadly torn, whereas with a man's buckskin garments she will experience no difficulty in making her way through the wild region through which she will pass.

Mrs. Knight shares the honor with Mrs. James Hensley, known by the miners of Castle, Montana, as "Little Dot," of being the only female miners in the world. "Little Dot"

is about 30 years old, and until her marriage with James Hensley, a year ago, had been a miner or rather a minereess, for the last ten years, doing all the work herself. She was shut off from civilization in all that time, wearing men's clothes and working in her mines with pick and shovel, not seeing the face of a woman for many years and very seldom meeting even a man. She accumulated property rapidly and when she took to herself a husband, this plucky little woman was worth at least \$75,000. In Montana "Little Dot" is as well known and respected as Mrs. Knight of Tacoma and Gold Hill will be before long.

A New Slime-Saver.

The Shasta County *Democrat* says:

Soon after Messrs. Yount & Reed, assayers, set up their assaying outfit in Redding, and after becoming familiar with the character of the gold-bearing quartz of the county, they discovered that the bulk of the value of the ores was carried off in the slimes. Judge Reed, who has had years of experience in mining in California, put his inventive mind to work to devise an apparatus for saving those slimes, at the same time freeing the slimes of the valueless gangue. He and Mr. Yount made a model, with which they experimented with various ores at their assay office, and found that the idea carried out in the model worked satisfactorily. About this time, W. D. Biegle and P. J. Bughee started up development work on the Sky Blue mine on the east side of the river opposite Middle creek. Messrs. Yount & Reed suggested to Mr. Biegle that he try their device on the Sky Blue ore, as it would cost only a nominal sum to put it up. Mr. Biegle did so, and having carried out their idea, has practically demonstrated that the slimer is a most gratifying success. In fact, it is a simple apparatus that will revolutionize mining in this county and State. With the slimer—that is the proper name for it—ten tons are concentrated into one, and the most the tailings will assay is one dollar a ton. The machine concentrates and saves practically everything of value there is in the ore. Fortunately for the machine, the ore in the Sky Blue is exceedingly refractory, as it carries copper glance, arsenical iron and copper sulphurets, free gold that will not amalgamate and every fine particle of quicksilver that has flourished. The machine even saves the copper glance which crumbles into an impalpable powder. Messrs. Yount & Reed inform us (and we can say to the miners of Shasta county that they are reliable in whatever statement they make on such matters) that their slimer, in this practical test, has proven a wonderful success and greatly exceeded their most sanguine expectations.

In company with Barney Conroy, W. H. Fowler, the mining expert, and Phil Bughee, we went out to the Sky Blue to see this new concentrating device work. Mr. Biegle was there, and took delight in showing and explaining how the thing worked. To our astonishment it is a most simple device, and does absolutely save slimes, for there they were running from the battery, over the plates, down a sluice-box and into the slimer, where they settled. To speak candidly, we are not prepared to say, at this time, that this slimer actually does the work claimed for it. That is to say, whether this one single slimer concentrates the values in the ore to the per cent claimed in this test. But it does save slimes as well as sulphurets and minerals which go off in suspension. There is one thing we are perfectly satisfied with, and that is this: The idea is unquestionably a good one, and applies itself directly to the natural peculiarities of the mass which flows from the battery. If one slimer does good work, but fails to save all that is necessary, one or more will; and in case, for instance, any heavy mineral substance which will not float nor amalgamate, but goes off with the gangue, that could be saved by placing the well-known vanner at the end of the slimer. Finally, after seeing this device work and seeing the proof before our eyes that it does save slimes, and rapidly, too, the thought forcibly strikes us that it is only a question of the number of slimers in any given plant to successfully and profitably work on the ground any of the gold ores in Shasta county.

COMBINATION OF MANUFACTURERS.—When the Employers' Association was formed for the protection of its members against the encroachments of unions, an article was inserted in its constitution which provided that each industry represented should be thoroughly organized, and when so organized should deal with all matters of interest to its members, and failing in any case to settle matters to its satisfaction should appeal to the general organization for assistance. Since the Employers' Association was formed several industries have been organized according to its requirement. The latest is the furniture manufacturers. It is said that 15 manufacturers are members of this branch of the association. William Kreling is President and Geo. Fuller Secretary.

CEMENT DEPOSIT NEAR GILROY.—A fine deposit of cement was discovered a few days since on the Lion & Backley ranch six miles north of Gilroy. Experts say it will equal the best Portland cement.

THERE are 60 miles of snow sheds on the Central Pacific Railroad.

Nevada County Iron.

A correspondent writes the following letter in a recent number of the *Grass Valley Tidings*: There is a general impression that San Francisco cannot manufacture iron and steel successfully; industries which if established would add wonderfully to the prosperity of the whole coast.

Nevada County Iron.

On this subject, Nevada county should be heard. In the southwest corner of this county, bordering on the plains, is a very large deposit of hematite and magnetic iron ores which will yield from 55 to 60 per cent of metallic iron. Of this iron ore, there is sufficient in sight to run a 50-ton furnace for half a century.

To show that this ore can be worked advantageously and to a profit in the city of San Francisco is the object of the writer. Capital is all that is required to develop a profitable investment.

It Will Pay.

First, it would be necessary to establish a line of communication from the deposit to San Francisco. This would consist of a railroad running seven miles through the foothills and 12 miles on the plains to the Sacramento river, from which point cheap water facilities would be had.

With such a transportation line, we will proceed to show the cost of making a ton of iron or steel in San Francisco:

Royalty on ore and loading cars.....	\$ 2.00
Freight.....	2.50
Coke, 1700 lbs. at 45c.....	7.65
Labor at furnace.....	1.80
Lime rock.....	1.00
Total.....	\$14.95

These figures are for one ton of molten iron, which would be of quality serviceable for castings, gas and water pipe and innumerable other articles of the trade.

A Big Shop.

By having a large shop so constructed that a locomotive carrying a crane ladle should traverse its center, molding space could be rented to all who desired it and the molten iron sold on the spot. This would save to individual firms the cost of expensive works, and such firms would be willing to pay from \$5 to \$6 over and above the market price of pig iron.

Furthermore, by keeping the iron in a molten state, it can be refined and used for all kinds of machine castings.

Steel.

And from the molten iron, by having the requisite Bessemer plant, steel can be produced at a cost of from \$3 to \$5 per ton, according to the quality. With rollers, the steel can be turned into any shape required.

It Means Much.

All this means that capitalists who are erecting six, eight and ten story buildings would no longer find it necessary to send their money East to purchase steel frames, and instead of San Francisco building up at one end, the new industry would build up both ends of the city by the employment of thousands of men, enriching the city by keeping the money at home.

At what other point on the Pacific Coast can the iron ore advantages I have outlined be duplicated? And in San Francisco, the market is at our door. San Francisco has obtained a start in the business of building steel ships and ironclads, but to hold its prestige and increase its business in that line something more than has been done must be undertaken and successfully carried out.

Nevada County's Offer.

Nevada county can show the capitalists by the Golden Gate how a ton of molten iron can be produced right at home for \$15.

The best quality of Bessemer steel for \$20.

Plates for ship-building for \$25.

Railroad iron and iron for building purposes for \$25.

These figures are maximum. Should the transportation line develop sufficient other traffic—and it certainly would, as the country to be traversed is very fertile—the cost of freight would be minimized. Such a line in time would pay interest on the investment from traffic other than the transportation of the iron ore.

Profits.

This molten iron, costing in San Francisco \$15 per ton, can be readily disposed of at \$28 per ton, a net profit of \$13 per ton. Estimating a product of 50 tons per day and 30 days a month, a monthly profit of \$19,500 is to be seen.

Should the company manufacture steel plates or castings, the profits would be still larger.

However, in the figures presented, is margin enough to yield six per cent on an investment of over \$3,000,000.

ONE HUNDRED ASSESSMENTS.—The *Virginia Chronicle* says: The assessment pending on Sierra Nevada stock is the one hundredth assessment levied by that company, and the number is the largest ever levied by a corporation, of which there is any record. The total sum of the assessments levied by the Sierra Nevada Co. to date is \$6,446,910, and \$102,500 has been paid in dividends, the last of which was disbursed Jan. 16, 1871. The amount of the assessments levied by the Sierra Nevada (\$6,446,910) is surpassed by only one Constock company—the Savage—whose total is \$6,770,000, but the Savage has paid \$4,460,000 in dividends, the last of which was paid June 11, 1869.

Averaged according to seasons, showing the amount in inches of each month, during forty-one years, and for each rising season, to Dec. 31, 1880; also the quantity for every month, and the annual amount of rain.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

El Dorado.

VAN.—Georgetown *Gazette*, Oct. 27: The new hoisting works on the Van mine is now in operation, and the mill is expected to start up this week. The building for the new ten-stamp mill on the Darling mine is already framed and will soon be equipped with a first-class plant.

Nevada.

THE FOUNTAIN HEAD.—*Transcript*, Oct. 28: Work has been temporarily suspended at the Fountain Head drift claim. The company have some money on hand, but not sufficient to continue operations to the desired extent. Everything at the mine is in good shape. The hoisting and pumping machinery is in readiness to be started on short notice. There is no doubt the Fountain Head will pay good dividends when it is once opened. It has the best of management in every way, and when the necessary funds for its proper development are insured—which will not be a very long time hence—it will be running again and will suffer no more interruptions.

TO START UP.—*Grass Valley Telegraph*, Nov. 3: On Monday next, work will be commenced on the Merrimac mine, situated just back of Glenbrook Park. Chas. E. Clinch and Cornelius Wilhelm have secured the mine and they will lose no time nor spare means in developing the property. This week articles of incorporation of the mine will be filed. The property will be in 100,000 shares, of which 40,000 will be set aside for a working capital. Mr. Chas. Stocks will have charge of the Merrimac in the capacity of superintendent, and is now making arrangements for the purchase of hoisting and pumping machinery. Years ago the Merrimac was worked by Geo. D. Roberts, Geo. Hearst and other well-known mining men, and at the time of active operation was very rich. The ore yielded about \$16 per ton on an average. Capt. Henry Scadden, who was the latest superintendent of the mine, and who knows all about the depths, is so confident about the mine that he is very enthusiastic over what is possible for its future.

Shasta.

MULETOWN MOUNTAIN MINES.—*Courier*, Oct. 31: John Doebelin of Muletown has discovered and is working a ledge, the Midoight, on Muletown mountain, in Centerville mining district, that gives flattering promise of developing into a big thio, the first assay going up to \$306 per ton in gold. On rock taken from the ledge at the depth of 40 feet, the working test assay was \$75.60 per ton in gold. The ledge is four feet wide and holds the same width at the depth of 40 feet. He has also located another ledge lately, the Crown Point, which is near the other location. Quartz from his last location, assays \$113 per ton in gold. We understand that several rich prospects have been discovered lately on or around Muletown mountain, which is four or five miles southwest of Shasta. Work on the Black Bear, owned by Jos. Bell, of this place, is being vigorously pushed forward, and if capital could only be induced to take hold of other ledges on that hill, the bullion output of the county would be largely increased.

Sierra.

CLEAN-UP.—*Mt. Messenger*, Oct. 31: Ninety-three ounces were cleaned up from 870 carloads of gravel, result of five days' work of near 40 drifters last week at the Bald Mt. Extension drift mine. Sixty men are employed. The channel is narrowing some and being followed northeast up the ridge. As soon as water is more abundant, the force of drifters will be increased.

QUARTZ.—We learn that some good quartz has recently been found in the old Dreadnaught mine beyond Alleghany.

BEDROCK REACHED.—The parties who are running a tunnel under the slide below Shady Flat had about reached bedrock last Saturday. The tramway at the Phoenix mine is in running order, and it is expected that the mill will be run steadily after next Monday. H. P. Parker, P. M. of Sierra City, was down this week. We learn that Mr. Morris has got the quartz mill at Logaville running. The report is that Dick Marshall has found favorable prospects in the tunnel which he has been so many years running in Jim Crow canyon. It is reported to us that the shaft in the Empire mine, at Gold Valley, is in very rich quartz and sulphurets. Some of the rock shows free gold. The sulphurets, recently tested at Grass Valley, yielded \$176 to the ton.

Siskiyou.

DISCOVERIES.—*Siskiyou Telegram*, Oct. 30: Myron Carrick has made some new quartz discoveries on the Humboldt mountains, which give promise to be exceedingly rich. Some specimens in which gold could not be seen with the naked eye were pounded out, in our presence, some days ago, and on being panned out, were found to be filled with gold. The quartz, it is said, will assay away up in the hundreds of dollars to the ton.

NEW HOIST.—*Yreka Journal*, Oct. 28: The Allen Bros. started up their new steam hoisting machinery last week, which works fine. It was manufactured by Firth & Co. of San Francisco, who sent a man here to put it in working order. In testing the machinery some 18 skips or about 9 tons of quartz were taken out, which pays from \$80 to \$100 a ton in crushing. The owners of the mine will keep their hands at work for the next six weeks in sinking down on the ledge, and then commence stopping to get out a large quantity of quartz to keep their mill running all winter.

RICH.—At the Little Wonder quartz ledge on Cherry creek, worked by Jas. Ironsides and F. J. King, very rich prospects have been found. The vein is rather thin, but may widen out at greater depth. Mr. Ironsides has another rich ledge in the same vicinity from which he will soon have a lot of quartz crushed. Chamberlain & Cooley, who have been prospecting a ledge on the upper end of Greenhorn creek, continue to find rich quartz from a narrow vein, which they feel hopeful will develop into a good-sized ledge when followed into the mountain. David Starr has a small ledge of quartz at the head of Hull gulch, near Mugginsville, in Scott valley, which prospects exceedingly rich and may develop into a wide ledge yet. He pounds out money enough in a hand mortar to pay running expenses

of his claim and support a large family, and has been doing so for two years past.

DEEP PLACERS.—Mr. Lincoln of McAdams creek is now drifting deep placer mining ground in Quartz valley and realizes \$16 a cap of four feet wide, with 20 bands employed. The bedrock is 106 feet deep, and the pay gravel is raised by water-power hoisting works. Dave McCook has received a fine turbine wheel from Ohio, which arrived here last week, and is to be hauled over to Forks of Humboldt for running his quartz mill in place of steam. By using water-power for running day and night, a great saving can be made, as firewood and salary of engineer amount to considerable.

QUICKSILVER.—The Siskiyou Quicksilver Mining Co., operating on West Fork of Beaver creek, Siskiyou mountain, in this county, expects to fire up at the new furnaces to-day since being rebuilt. The company has a large quantity of very rich cinnabar ore on hand, to be put through the usual process of retorting. Some very good prospects have been discovered on the head of Beaver creek, in the placer diggings, and by next spring when the winter snow goes off, there will no doubt be a large number of miners in that section and in the vicinity of Hungry creek.

San Diego.

JULIAN DISTRICT.—*Sentinel*, Oct. 29: A conservative estimate of the present gold output of the Julian mines, including the Stonewall, places it at \$17,000 per month. Of this amount \$10,000 is expended at the mines for wages of miners, purchase of material and repairs, which sum eventually finds its way to the coast through the medium of stores and remittances for supplies. Prominent among those mines that are giving good returns is the Helvetia, whose fame right royally deserved has been spread afar by the press of our country. In this mine the pay shoot has been followed 100 feet, the vein varying somewhat in richness, but to-day there stands in the face of the drift a three foot vein of as rich ore as one could wish to see. The upraise that has been carried along with a height of 27 feet has not found an end to the rich rock. Eighteen men are kept at work here, day and night shifts being run.

The first clean-up of the mill on this bonanza ore was made Thursday, the result being a gold brick of big dimensions. The lessees of the Warlock are busily breaking down gold rock. The last crushing of ore from this mine averaged \$38 per ton. The Cincinnati Belle is kept steadily at work upon ore that would prove an eye opener to the man who believes there are no San Diego county mines. There is a curious freak of mother nature to be seen at the Ruby. The lower level of the mine follows a continuous ledge of very rich ore, while 30 feet above this in the upper level the vein consists of a succession of kidneys, with a narrow strip of waste between them, each kidney differing from the others in character of rock and richness. The greatest body of ore in the camp is to be seen at the Ready Relief, the property of the Bailey Bros. There is a labyrinth of tunnels, shafts, upraises, etc., and on every hand wide veins of ore of surpassing value. The elegantly equipped Gold King mine is employing a small force, with good ore in view. At the Waterman tunnel in the Blue hill mine work is progressing slowly. A large body of feldspar was recently met and cut through, then a streak of iron ore and the pick is now striking in feldspar again. Some experienced miners claim the indications in this prospect tunnel to be prophetic of a large body of auriferous quartz close by. Much has been said and written about the Stonewall in the past year, and the most conflicting reports have been circulated, some to the effect that the ledge had capped over, other reports were to say that the mine was working richer ores than ever before known in the history of the mine. There is no denying the facts that this magnificent property has been running smoothly for many months, employing a large force of men night and day, that an immense ore body is in sight and that the gold output is exceedingly gratifying to the heirs of Governor Waterman's estate. Not alone in gold does the miner necessarily have to wrap his attention, but the copper mine near Shaw's mill, not far from Julian, is being put in shape for extensive development. The excellent wioze and plant that was formerly at the Antelope has been put over the copper mine, and work can now be prosecuted to a greater advantage.

NEVADA.

Washos District.

SIERRA NEVADA.—*Virginia Enterprise*, Oct. 30: West crosscut No. 1, from the northwest drift, 630 level, 571 feet from the shaft, has been advanced 33 feet; total distance, 1221 feet; face in quartzite. The north drift from the Kenosha tunnel was advanced 44 feet; total distance, 241 feet; face in porphyry.

OCCIDENTAL.—Milled during the week 120 tons of ore of the average value \$19.10 per ton. Have stopped the mill for the present and resumed prospecting on the several levels. A crosscut from a south drift on the 350 level is entering the ledge and is showing some good ore. East crosscut on 750 level is in 18 feet; face in quartz and porphyry, giving low assays.

UNION SHAFT.—West drift from shaft, 900 level, has been advanced during the week 33 feet, making a total distance west of shaft 1296 feet; face in clay and porphyry.

ANDES.—On the 420 level enlarging shaft station. Completed repairs to main north drift. North drift from east crosscut No. 4 advanced 14 feet; continuing in quartz.

BULLION.—The east crosscut on the north line, 1300 level, is out 147 feet; face in clay and porphyry. Have been timbering during the week the south drift from winze station, 1400 level of Potosi.

SILVER HILL.—Northwest drift, 50 level, is out from shaft 425 feet; face in quartz and porphyry. South crosscut 160 level, is out from winze 790 feet; face in hard porphyry.

WARD COMBINATION SHAFT.—The southwest drift, 1800 level, is out from the shaft 560 feet; face in porphyry.

CHOLLAR.—The east crosscut on the south line, 1200 level, is out 135 feet; face in porphyry. The south drift from the incline station, 1500 level, is out 272 feet; face in porphyry.

UTAH.—East crosscut No. 1, 725 level, started from the southeast drift at a point 500 feet in, has been advanced 50 feet; face in clay and porphyry.

POTOSI.—East crosscut on south line, 1300 level, is out 147 feet; face in clay and porphyry. The

north and south drifts from the winze station, 1400 level has not been advanced during the week, owing to timbering the drifts. The south drift from winze station, 1500 level, is out 74 feet; face in soft porphyry.

ALPHA.—Have completed timbering shaft, and will resume work in the mine to-day.

EXCHEQUER.—Have completed shaft, and will resume work on the 600 level to-day. The joint southwest drift from Ward shaft, 1800 level, is out 550 feet; face in porphyry.

CON. NEW YORK.—The east crosscut No. 3 140 feet north of shaft, 650 level, is out 15 feet; face in clay and porphyry. The east crosscut, 700 feet north of shaft, 1100 level, is out 21 feet, the whole distance in quartz, some of which yields fair assays.

Hawthorne District.

LAPANTA.—Walker Lake *Bulletin*, Oct. 28: The body of ore below the Bradley incline still continues to show well. The north drift from the north upraise above the main tunnel still continues to show well, 660 ore.

PAMILCO.—Work is being pushed with the same force. All points showing well. Producing good ore.

CENTRAL.—Stopping still continues above the north drift. Stopes yielding very well.

FAIRMOUNT.—Still sinking the wioze below the tunnel and stoping above the south drift in the winze.

RIP VAN WINKLE (Marietta).—Main tunnel being pushed with two shifts. Formation changes—much softer; ore vein increasing in size and improving in quality.

Montgomery District.

THE BREVYFOGLE.—Walker Lake *Bulletin*, Oct. 28: J. G. Kaufman, who left Mason Valley some months ago for the Death Valley country, returned last Tuesday. He says there are some rich gold mines in that section, and reports that a Huntington crusher of ten-stamp capacity is being put in to work ore from one of the mines. It is not a poor man's country.

Jefferson District.

SALVATOR.—Belmont *Courier*, Oct. 30: We learn from Supt. T. A. Oliver that the work of laying the air-pipe in the Salvator mine at Jefferson is completed, and that the work of development will be prosecuted with energy.

Paradise District.

COPPER.—Belmont *Courier*, Oct. 30: From James Graham, of Grantsville, we learn that M. San Pedro expects to begin operations in the copper mines in Paradise district, Nye county, in the near future. These are undoubtedly valuable properties.

Jett District.

TO RESUME WORK.—Belmont *Courier*, Oct. 30: Messrs. Oliver and Warburton inform us that the mines in Jett and Pablo canyons, in this county, are looking well, and that work will be resumed on these properties on a large scale in the near future.

Cherry Orisk District.

PROMISING.—White Pine *News*, Oct. 31: Parties in from Cherry Creek inform us that the mining and business outlook over there is more promising than for some time past. The Egan and Ti-cup mills are being run on tailings, and the lessees at the former have already got out two nice bars of bullion. R. H. Frank has also started up his mill in Granite district. We would like to see all the boys make a stake before the hard winter sets in.

Whites Pine District.

HAMILTON.—White Pine *News*, Oct. 31: From Recorder Cupid, who spent a week or more looking around the great mining field adjacent to Hamilton, we get the information upon which the following items are based: The reported sale of the Cornell mine is off for the present, though its increasing output and fine showing of ore leaves little doubt but it will find a purchaser shortly. Cornell took out of his mine on the 20th instant, sacked and sewed, 150 sacks of ore of 130 pounds each, which averaged 27 ounces in silver and 65 per cent lead. This ore, after paying all expenses, will give a net return of \$32 per ton. Last week six carloads of ore were shipped from the district to Elko. Roco Kragnaize's mine, out on the Sherman town road, is a big thing, and the ore is of high grade, going 72 ounces in silver and 70 per cent lead. Ed Daily, Alex. Muir, J. B. Mathewson and "Brick" Pomeroy have struck a very promising prospect out on the Sherman town road. They are working it and taking out some very rich ore.

ARIZONA.

BULLION.—Prescott *Courier*, Oct. 30: Another shipment of bullion from the Tiger mining properties will soon be made. Machinery for the new five-stamp mill to be erected on the Segregated Paroelli mine is at the depot and will be loaded on wagons to-day for transportation to the mine. Lew Alters is in from the Antelope country; says nugget-hunting is still in progress on Rich Hill; that Wm. Parridge has a fine property in his extension of the Johnston mine, which he is working steadily. The Arizona Ore Co.'s works are kept pretty busy at present on custom ore, the main supply coming from the Crowned King and Catocin mines. Geo. Weckler was in town on Saturday last from the White Spar mine. This mine is the property of Messrs. Wickler & Snapp, is located about 14 miles south of Prescott in the neighborhood of the celebrated Catocin mine. It has been developed by a shaft 100 feet deep and a tunnel 140 feet in length; has a well-defined vein of silver ore two feet in width which yields \$250 to the ton.

MOHAVE COUNTY.—*Miner*, Oct. 31: Tom Burch was in town a few days this week in search of a pack-train to pack out a number of tons of ore from the Hope mine in Cedar. The C. O. D. concentrator is running along smoothly and turning out large quantities of concentrates. Experiments are being made with the machine to test its capacity for saving slummy ores. Henry Brown is in from Weaver and reports everything in a flourishing condition in that bonanza mining camp. The new road is now close to the river and will shortly be in condition for teams to pass over it. The Nighthawk tunnels are being driven in as fast as workmen can do it, and in each good ore is encountered. Supt. Bowers has returned and will prosecute work on the bonanza mine of Mohave county with a will. The ore recently shipped to San Francisco netted a handsome dividend to the owners. A number of arrastras are being run on the soft gold ore of Gold

Basin and are paying well. Several more it is expected will be built in Lost Basin and run on the rich ores of that region this winter. The barges on which the floating-wheel will be placed are being slowly worked up the river. The low water in the river makes the work of running the boats up stream rather slow. The mill will be located on shore at Green bay and will be of 25 tons capacity. It is expected that work will be started up on the Arnold mine, Cedar district, in a short time. Two lessees are at work on the mine, and are taking out rich ore. James Mulligan has for some time past been running a tunnel on the Big Bethel mine, one of the largest and best ledges in Mohave county, and has taken out an immense amount of good grade ore.

COLORADO.

SUB-LEASES.—Elk Mt. *Pilot*, 29: A number of sub-leases have been let on the Sylvanite mine, we believe, on the old workings, and W. J. H. Miller will turn his attention toward driving the crosscut tunnel. Supplies are going up from town for the winter. The crosscut tunnel, in the Snow Drift group, out near Pearl Pass, is about 700 feet, which is about far enough to cut the vein, which will be at a depth of about 700 feet. This property belongs to the Casson Bros. of Aspen, who deserve much credit for their perseverance. The machinery on the Cumberland mine is in place, and the air-compressor drill has started on its long journey of 1600 feet into the mountain. Many improvements have been made lately in the concentrating mill at Irwin. Steam power and steam heat are now being put in, preparatory to running the mill all winter. Hereafter the mill will be operated by the Irwin Milling and Power Co. This company is composed of P. F. Roppel, F. W. Fuller and Eastern parties. They contemplate further improvements next year, including the introduction of an electric power plant in connection with their water power, to furnish power for the operation of mines and mills at Irwin.

IDAHO.

POCATELLO NEWS.—Cor. Idaho *Statesman*, Oct. 30: The interest manifested here in the mines has not abated in the least, but on the other hand increases as each day brings more and more encouraging reports from the claims on which development work is being done. The mines in the townsites are the only ones on which actual and permanent work is being done. Those having claims on the reservation do not care to do more work than make locations until the reservation is thrown open. The mines in the townsites have never been properly described, and a brief outline of their formation may not be out of place. The galena veins are in a formation of blue limestone lying alongside of iron veins, which invariably run together as depth is reached. They are well-defined fissure veins and usually narrow at the surface, widening as they are worked down. The footwalls are of granite formation, the hanging-walls of blue limestone. The ores taken from the different veins are of different formations, some as foreign to the others as are the ore bodies of the Butte mining district. The Chief produces galena rich in silver, with average assays at \$65 per ton in lead and silver, while directly south is the Hungry mining claim, ore from which runs about \$75 in copper and silver. Again, the Bannock, north of the Chief, runs from \$25 to \$200 per ton in copper and silver. All the veins show gold. The Scarecrow lies immediately to the west of the Chief, and ore from it which is being taken out every day shows free gold. The strange formation has puzzled all the experts who have examined the ground.

ROCKY BAR.—Idaho *Avalanche*, Oct. 31: From a miner just arrived from Rocky Bar we learn that the Alturas mine, now going under the name of the Elmore, has just made a very rich and important strike that will bring this once-famous mine to the front again. The new strike is said to be in new ground, below the lower levels, found while sinking a winze. The ore is said to be exceedingly rich and the full width of the winze.

POORMAN.—From outside talk we learn there has been some very rich and important developments in this mine during the past few days.

RUTH.—The lower tunnel on this mine is being pushed ahead at the rate of 4 to 5 feet per day. At this rate it will not take long to reach the big shoot of ore opened in the tunnel above.

FLINT.—The mill at this camp is now running day and night on rich ore, plenty of water having been secured. A large force is at work putting in the new machinery.

MONTANA.

STRUCK IT RICH AGAIN.—*Inter-Mountain*, Oct. 29: Mr. Carter, the Gallatin Valley farmer who turned his attention to mining about a year ago, and whose every step in that direction has proven profitable to him, is again fortunate. It will be remembered that it was under Mr. Carter's lease of the Ground Squirrel that that property developed into one of the richest in Butte, and from which Mr. Carter realized a small fortune by selling out to the Butte & Boston Company. After giving up this lease, Mr. Carter did not abandon mining but looked around for something new, and about two months ago he secured a lease on the Manhattan lode, a property in a lot on Montana street, just below Porphyry. Within the past few days it has transpired that Mr. Carter has struck it rich again, his possession this time being a large body of ore that will go from 140 to 160 ounces to the ton. There is very little room for dumping ground in the vicinity, the neighborhood being thickly settled with dwelling houses. Mr. Carter is so elated with the discovery that he has concluded to explore the property to a greater depth and has placed an order with the Utah & Montana Machinery Co. for a new hoisting plant of 500 feet capacity.

NEW MEXICO.

LAST CHANCE.—Silver City *Enterprise*, Oct. 30: The Last Chance is coming to the front and is making a shipment of bullion weekly. The owners of this property are to be congratulated. Georgetown is not making much of a stir just now, yet development work is progressing steadily. When Gen'l Supt. Peby returns, sampling works will be put up on the Mimbres Co.'s properties. The Iron Head

mine of Hanover, was this week sold by Perry B. Lady, administrator of the Coomer estate. Price not stated. There seems to be a great deal of activity in iron mines at Hanover at the present time. Quite a number of mines in that district are under bond and several other sales are pending. Knott & Noel have let a 100-foot contract for sinking a well to Caesar Brock. They have \$10,000 worth of ore in the dump, and as soon as they get water, will have a five-stamp mill pounding in high-grade ore. The mill will be moved from its present location nearer to the mine. Malone will soon take on a regular boom.

OREGON.

QUARTZ.—Developments of a very promising nature continue to be made at the Steamboat quartz ledge, and Mr. Smith is sanguine that the vein of ore he has been looking for so long has at last been discovered. Work will be continued energetically. J. T. Wilson now has a shaft down 125 feet on the Patton ledge in Talent precinct for the company by whom he was employed to do the work. It prospects first-class at present, and all parties interested are hopefully awaiting developments. Henry E. Ankeny, superintendent of the Sterling mine, informs us that the water supply is increasing steadily, and he expects to have enough water to run one pipe in a very short time. The ditch is now being put in repair, and some bedrock that was not cleaned up will probably be attended to first.

PLATINUM.—A platinum mine has been discovered about six miles from Grant's Pass, in the Louse Creek country. Wm. Platt, who brought in specimens of ore last Saturday, declined to tell the exact location, but that he has a good lead seems evident. Platinum is more precious than gold, as it is used largely in electric lighting.

The Woodbury Concentrator.

It is little more than a year since these machines were placed on the market. That they are finding much favor among millmen is evident from the following list of concentrators sold and in daily use, furnished by Geo. E. Woodbury, the inventor and manufacturer:

Keystone Mining Co., Amador City, Cal.; 5; Francis, Valentine & Co., Hathaway mine, 4; A. Halsey, Mother Lode mine, 2; B. F. Hartley, Anburn, Cal.; 2; Gover Mining Co., Amador City, Cal.; 5; W. S. & S. W. Chapman, Georgetown, Taylor mine, 4; Mary Murphy Mining Co., Romley, Colorado, 12; Bell Maxwell, Balfview mine, Sonora, 2; Pat Murphy Mining Co., St. Elmo, Colorado, 5; John Porshaoker, Mexico, 2; Jewel M. Co., Grant's Pass, Oregon, 1; Yankee Boy mine, Colorado, 1; S. S. Badger, Orray, Colorado, 5; So. Spring Hill M. Co., Amador City, Cal.; 2; San Joaquin Estate tin mine, Temescal, Cal.; 1; W. H. Flanagan, Grant's Pass, 1; W. H. Howland, Casco mine, Jackson, Cal.; 2; Wineford Mining Co., Arizona, 2; Sailor Jack mine, Shingle Springs, Cal.; 1; Centennial Chief M. Co., Leadville, Colo.; 2; Golden State Miners' Foundry, San Francisco, 1; Rand Drill & Rocaock Co., Sydney, Australia, 1; J. J. Chapman, Jackson, Cal.; 1; Edward Price, Breckenridge, Colorado, 4; Quartz Mining Co., Amador City, Cal.; 5; G. G. Hoher, Silverton, Colorado, 2; C. H. Reno, Galena, Nevada, 2; American River Syndicate, 4; Hendric & Boltz, Denver, Colorado, 2.

Eighty-three machines in about 15 months is a pretty good showing. The kind of satisfaction that they are giving is shown by the accompanying letter from the manager of the Temescal tin mine:

THE SAN JACINTO ESTATE,
OFFICE OF GENERAL MANAGER,
CAJALEO, Oct. 30, 1891.

Geo. E. Woodbury, Esq.—DEAR SIR: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" concentrator placed in our works by you, I am pleased to inform you it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrator equally clean, as from either of the machines at work here. I am yours faithfully,

[COPY.] S. HARRIS, Mine Manager.
P. S.—The machines referred to above are the Frues and Triumphs.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb.	14 @	English, B.	16 @ 20
Refined, in car lots	8 @	Caston tool.	9 @ 9
Powdered, do.	8 @	8 1/2" Diamond tool	9 @ 9
Concentrated, do	7 1/2 @	Pick & Hammer.	8 @ 10
All grades jobbing at advance.		Machinery	4 @ 5
COPIER.		Toe Calk.	4 @ 5
Bolt.	22 @	TIN PLATE.	
Sheeting.	22 @	B. V. steel grade	
Ingot, jobbing.	— @	14x20, spot.	5 75 @
Do, wholesale.	— @	14x20, 14x20	6 50 @
Fire Box Sheets	22 @	Do, 20x28.	13 00 @
IRON.		Fig. 18, spot.	13 @
Bar, heavy.	3 @	irreg'lar, com'l	— @ 21 1/2
Norway, base.	4 @	COAL.	
P. O. IRON.		SPOT FROM LAMP—PER TON.	
Spot. Load.		Wellington.	87 50
Eslington 30 ton.	25 00	Gretta.	8 00
Glenagrock.	25 00	Carbon Hill.	8 00
Am. Soft. No. 1.	25 00	Namino.	7 50
Oregon Pig.	30 00	Gilman.	7 00
Puget Sound.	30 00	Seattle.	7 00
Arg Lane White.	24 00	Oose Bay.	6 00
Shots, No. 1.	25 00	Chapel.	14 00
Langdon.	25 00	Egg hard.	14 00
Thorndiffe.	26 00	Cumberland, in sacks.	14 00
Gartsherie.	25 00	Do, bulk.	13 00
Barrow.	25 00	Wall end.	9 00
Chromite.	25 00	Scotch Split.	8 00
CHROME IRON ORE.		Bryah.	8 50
Perton.	10 00 @	West Hartley.	8 00
LEAD.		TO LOAD—PER TON.	
Bar.	42 @	Austral.	122 @
Pig.	54 @	Liverpool St. am.	7 00 @
Sheet.	74 @	Scotch Split.	7 00 @
Pipe.	64 @	Cardiff.	7 25 @
SILVER.		Light Lamp.	13 00 @
(Discount 10% on 500 bags.)		Cumberland.	10 00 @
Drop, 100 bags.	1 30 @	Egg, hard.	— @ 11 00
Bulk, 100 bags.	2 10 @	West Hartley.	— @ 7 50
Quicksilver.	2 20 @	COKE.	
By the flask.	43 00 @ 60 00	English, to load.	39 00 @ 11 00
Flasks, old.	40 @ 60 00	Do, spot, in bulk.	12 00 @
		Do, in sacks.	15 00 @

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 5, 1891.

General trade continues fairly active. The feeling of confidence in the future is more strongly riveted in commercial circles than has been known for years. Money is becoming plentiful, with interior merchants paying up better than at any time for almost five years past. Iron importers report a large demand for pig, causing a firmer market. The collapse of the molders' strike is accepted as favorable to future business here. The last Australian steamer brought in about \$1,200,000 in sovereigns. The imports of gold from that colony has, so far this season, been quite large. The Eastern money market is very easy. The following from a New York exchange reflects the situation there: "The financial outlook, from the bankers' and mercantile standpoint, improves from week to week. The predictions of optimists have been more than verified up to this date. Bankers are gratified in observing the free return of gold from Europe, which was believed to have been necessary to avert a crisis of some severity. It comes in season to meet a demand of at least \$3,000,000 a week from the interior to move the crops. The calculation is made in a general way that a favorable balance in the foreign trade, equal to something like \$200,000,000, must be liquidated by sending either gold or its equivalent in merchandise or securities. Exports of grain alone will call for \$150,000,000, and as a great deal of imported merchandise remains unsold on account of overstocking previous to the new tariff, it is reasoned that imports for some time will be on a reduced scale. Cotton, too, will continue to go abroad in large quantities, both raw and manufactured, but at a valuation which, for the present, cannot be determined. Altogether the prospect is good for a return of gold equal to or even in excess of the temporary loss. Americans, therefore, reasonably look for easy money."

QUICKSILVER.—Receipts the past week were 466 flasks Californian and 400 flasks Spanish, via China, en route for Mexico. The market is very strong at full figures. Oregon advices report a favorable outlook for opening the mines in Southern Oregon.

MEXICAN DOLLARS.—The market is essentially unchanged at about 74 1/2 cts. The weak markets ruling for silver are against Mexican.

SILVER.—The markets abroad and at the East have been gradually sinking, with slight fluctuations. It is difficult to get to the true inwardness of the depression further than a prevailing opinion that it is the work of a strong manipulating monied syndicate for future operations on the bull side. It is semi-officially announced that our Government is making overtures to European Governments looking to an international agreement on silver. It is also stated that the outlook is quite favorable for its accomplishment. The success of the Democratic party in New York and Massachusetts and its defeat in Ohio is accepted by Wall street and financiers generally as committing that party against buying and storing silver in bars.

LIME.—Receipts the past week aggregate 3614 hhls. The demand is only fair. The output appears to be regulated by demand.

BORAX.—Receipts the past week aggregate 455 cts. The market is strong under reports of a new pool being formed to more fully control the output of this coast.

LEAD.—The market is heavy, with quotations barely steady. At the East, an unsettled feeling is reported.

TIN.—The market is weak and irregular. Higher outward charters from England offset any decline in prices of plate there. A large English works—the Abercane—has closed for the want of remunerative business, this has caused a drop in pig abroad.

COPPER.—There appears to be a growing feeling that for the time at least the lowest prices have been touched, or, in other words, the starting up of the Anaconda mines was discounted. A London cable to the *Iron Age*, Oct. 29th, says: Copper has been unsettled and depressed, with many holders alarmed at the aggressive action of the "bear" party and reported reopening of the Anaconda mines, with promised large production. Some good buying took place at the lowest prices, and reduced offering has restored confidence in some degree. A great deal of copper has passed into strong hands, and it is suggested that the market has been smashed by powerful operators interested in Rio Tinto and other mining shares. The consumption is good and an increased demand for sulphate is noted.

IRON.—The local market, after sinking to lower figures than ever before, appears to be gaining in strength. It is said that heavy buying has caused a better concentration of supplies both on spot and to arrive. Higher outward English charters are against shipments from that quarter except at higher prices. Imports at this port the past week aggregate 280 tons from Swansea.

COAL.—Imports the past week aggregate 21,923 tons as follows: From Tacoma, 6400 tons; Coos Bay, 490; Comox, 4450; Seattle, 4410; Newcastle, N. S. W., 1350; Departure Bay, 1200; Liverpool, 2100; Swansea, 1508. The spot market and nearby cargoes continue in buyers' favor. Yard room is scarce, which causes lower prices for cargoes that require immediate discharging. Absence of cold weather is against a strong demand for household coals, but the consumption of steam continues large. It is conceded that present low prices will continue until well into 1892. Higher outward charters at Australian and English ports are against shippers.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Mining Share Market.

Mining shares the past week were decidedly mixed, mixing up chippers and outside operators in their opinions regarding which way the "cats" will go in a most beautiful chaotic condition. The pool is unable to longer disguise their hands, for it is too plainly evident they are determined to milk the street of every share possible before starting the bull campaign that is certain to come. In several mines they are uncovering good milling to high-grade ore, which will pay handsome returns for milling. Before the MINING AND SCIENTIFIC PRESS commenced, over three years ago, an active crusade against the manner in which several of the Comstock mines were being looted, the rings feared no one and cared very little whether they owned stocks or not, so long as they controlled the mines through the pernicious proxy system and got all they wanted (the hullion), while outside shareholders got the assessments. This paper's course was largely instrumental in calling into life the Mining Stock Association, which for all of three long years has made a strong fight against the rings, and which at this writing promises to prove a glorious victory for the right. The stock pools, mill rings and kindred organizations, seeing defeat certain, for months past have been making every effort to compel outsiders to sell their stocks. Driven to their last ditch, they appear to be making their last desperate move and are throwing bombs (assessments) right and left, and by every other means possible, trying to create complete demoralization, so as to make more successful bear raids. They know that in several mines a more encouraging outlook was never before had, and stocks they want so as to get the dividends which must come sooner or later now that they are in a fair way to be prevented from looting the mines. The writer still maintains the opinion expressed last week, that although quotations for shares may be manipulated lower, yet the person who buys stocks and pays cash, and pays one assessment, if it comes before a rise in prices, will have no occasion to regret the venture. The trouble with the public is, they have no time to make money; if they buy they want immediate results, forgetting that the large and successful operator often waits several years after buying so as to net a handsome profit, which, when it comes, he gets by selling at the time gudgeons are buying. Outsiders often buy more than they can pay for, and in consequence stand between two fires, one in being sold out if stocks go down and the other in the broker failing if stocks go up.

The pool is using Con. Virginia as a lever to milk the street of the stocks, they are particularly desirous of buying. They also appear to be assessing those they want, and are putting out points that no stock, except Confidence, in the Middle or Gold Hill groups will sell at much, if any, over \$1 a share before the bull campaign starts in. While the writer does not know if these points be correct or wrong, he does say that the situation in the mines warrants much better prices.

News from the Comstock mines continues to be suppressed so as to more successfully manipulate stocks to get them better in hand at lower prices. In Sierra Nevada, Union, Mexican and Ophir the good news that is now kept back can be looked for at almost any day after this month. In Con. Virginia they ought to report within the next three or four weeks a strike on the 1700-foot level. The 1800-foot level is being developed for extracting ore that should cause the mine to resume dividends. In Best and Belcher, and also in Gould and Curry, favorable news is kept back.

In both Hale and Norcross and Savage they are uncovering rich and large ore deposits. In the latter mine on the Suto tunnel level, there were several thousand tons of ore dumped years ago, which should be taken out and milled as it is extracted; the cost would only be for hoisting, transporting and milling, and as the ore assays quite high, dividends should be paid from it. When the Suto tunnel stopped work in Savage, the face of the tunnel was in high-grade ore. The ore is still there. From the Ward Shaft a drift was run into Exchequer and a strike was made, but which the officials failed to report. In Con. Imperial, Challenge and Confidence, and extending into Alpha, very important work is being done, but particulars are kept back. They ought soon to have the water pumped out below the 1700-foot level in Yellow Jacket, Kentucky, Crown Point and Belcher mines, which, when done, will enable them to extract for milling the high-grade ore on that level that the late Senator Sharon was unable to take out, owing to the mines not being able to handle the water. When work was stopped the face of the crosscut on that level was in high-grade ore. Is it not about time for Overman to show up higher grade ore? It looks as if all outsiders are about frozen out of their stock. In Potosi and Bullion active development is still under way on several levels; particulars are held back so as to buy cheap stock. When the present freeze-out in the Alta group is over, good news is in order from that quarter.

From the outside mines, favorable news continues to come to hand, yet the market is made sick so as to encourage outside selling and discourage them from buying.

Mining shares opened this (Thursday) morning dull and heavy, with outsiders selling. Quite a number of large outside accounts were closed out the past week. The Middle and Gold Hill stocks are about as low as they generally get; at any rate, a buyer does not, in the writer's opinion, run much if any risk at present prices, provided he pays cash.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

ATMOSPHERIC PAINT COMPOUND CO. Oct. 23. Capital stock, \$100,000. Directors—John Sorenson, E. Jungerman, W. B. Frederick, Henry Behneman and James E. Watson.

IOWA DITCH CO. Oct. 30. Object, to dig a ditch in Fresno county, starting at Fowler Switch canal. Capital stock, \$24,000. Directors—E. H. Miller, F. S. Donly, L. J. Holton, S. Gewer and B. W. Hartie.

HARKNESS G. M. CO. Nov. 1. Capital stock, \$1,000,000. Directors—Alfred Dixon, J. E. Chapman, W. S. Chapman, A. P. Moore and E. F. Stine.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 27, 1891.
462,195.—WHIFFLETREE HOOK—C. W. Blackburn, Tombstone, A. T.
462,132.—LAMP STOVE—R. A. Hickox, Santa Ana, Cal.
461,940.—RUNNING GEAR FOR VEHICLES—R. L. Kirby, Pomroy, Wash.
461,842.—HOUSEHOLD ARTICLE—A. J. McDonald, Blaine, Wash.
462,014.—ELECTRIC RAILWAY—G. W. McNear, Oakland, Cal.
462,099.—BUNDLE WRAPPER FOR CIGARS—A. & J. Michaltschke, S. F.
462,015.—TRUSS—Robt. Nagler, S. F.
461,984.—FOLDING LADDER—Wm. M. Penry, Jackson, Cal.
462,165.—SHOW TABLE AND BEDSTEAD—M. Rosenbaum, Tacoma, Wash.
461,986.—GATE—T. Scheibel, Santa Rosa, Cal.
461,987.—DERRICK FORK ATTACHMENT—J. S. Scott, San Jose, Cal.
462,173.—REIN GUARD—J. N. Southrey, Stockton, Cal.

The following brief list by telegraph, for Nov. 3, will appear more complete on receipt of mail advices:

California—George Bryant, San Francisco, shoe; Frederick W. Dohbel, Purleima, eight for firearms; Wesley Gibbs, Los Angeles, piano action regulator; Peter H. Gibson, San Francisco, construction of floors or walls; John Kerwin, Beckwith, lever-power mechanism; Emma Martel, San Francisco, curtain-pole supporter; Edward North, Newhall, check-book; Almarin E. Paul, San Francisco, apparatus for treating gold and silver ores; Henry Richmond, Santa Cruz, rotary air compressor and pump; Michael C. Taylor, Grass Valley, bedstead; Charles S. Weber, San Jose, stringed instrument; George F. Wells, San Francisco, automatic organ.

Notes.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ELECTRIC RAILWAY.—Geo. W. McNear, Oakland, No. 462,014. Dated Oct. 27, 1891. Although this invention is applicable to all kinds of electric conductors whether arranged overhead or in subways, it is shown in its most applicable form in a subway or conduit. The object of the invention is to thoroughly insulate the electric conductor. Dependent from the under side of the conduit are brackets arranged at suitable intervals and insulated. The brackets carry an insulating sack, which is in the form of a closed tube made of some suitable insulating material—preferably rubber—which is sufficiently flexible in its nature as to admit of being collapsed. Within and confined wholly by the insulating sack, is the metallic electric conductor, which, together with the insulating sack, extends the whole length of the conduit. The under surface of the electric conductor within the sack is exposed to the contact of pieces carried by the sack, and which are adapted to be pressed against the conductor by the passing trolley of the car on the tracks overhead. At the same time the electric conductor is so enclosed that there is no wastage such as is common in electric conductors.

DERRICK FORK ATTACHMENT.—Jasper S. Scott, San Jose, No. 461,987. Dated Oct. 27, 1891. This is an attachment for that class of implements known as "derrick forks," and its object is to provide a convenient means for transporting straw from the stack to a point where it is to be delivered to the thrashing machine or other place of deposit. By the construction adopted a connection is formed with the derrick fork after the load has been discharged so as to hold it up until it shall have traveled down the inclined rope to a point above the stack, after which it is released from a ring and allowed to drop directly upon the stack. If it were not for some device of this sort, as soon as the hoisting rope was relieved of the tension the fork would simply be lowered at the point above which it was at that time suspended, while by means of this device it is prevented from being lowered until it reaches the point where it is desired to lower it upon the stack. By the arrangement described in the patent, the loaded fork is moved up the incline, the load discharged at the desired point and the fork retained in its suspension from the traveler until it is again moved down the incline to a point where it is to be dropped upon the stack.

GATE.—Theobald Scheibel, Santa Rosa, No. 461,985. Dated Oct. 27, 1891. The gate is suspended by rollers traveling upon a horizontal guide or track. A lever is pivoted in the center post and its end passes through a slotted guide upon the gate, which has suitable anti-friction rollers at each end. The levers which extend out in each direction along the roadway have their inner ends connected with the centrally pivoted lever above mentioned, and when either of them is pulled down, the inner end pulls this lever up and this acts upon the gate to cause it to slide along until the lever has moved over and passed the center, when its weight is added to the momentum of the gate and assists to finish the movement. Suitable locking catches hold the gate at either end of its travel, these being disengaged by the first upward movement of the lever.

TRUSS.—Robert Nagler, S. F., assignor of two-fifths to Frederick Wegman, No. 462,015. Dated Oct. 27, 1891. This invention relates to certain improvements in trusses which are applicable to persons afflicted with rupture. By the adjustments described in the patent the pad can be moved into various positions, the belt may be reversed, and by taking the slide out and introducing it into the other end of the guide-plate the same belt may be worn upon either side. The guide-plate may also be shifted or turned upon the end of the spring so as to apply the pad to a navel rupture or any part where it may be needed.

MECHANICAL PROGRESS.

New Manufacturing Processes.

At one of the Pittsburgh, Pa., machine shops a new process has recently been introduced in the manufacture of compound metallic tubes, that is, tubes of one metal covered or lined, or both, with another metal. In the lining of a tube, a hard mandrel is taken, the diameter of which is the same as desired for the inside of the lining of the tube when finished, and the metal lining is placed around the mandrel and rolled through or between hard surfaced rolls until the lining is reduced to the desired thickness; the tube that is to be lined is now slipped over the lining, and the rolling process continued until the tube is rolled tightly on to the lining and reduced to the outside diameter desired, after which the mandrel is removed and the tube cleaned. If the tube is to be covered as well as lined, the mandrel is left inside the lining, the metal cover is slipped over the tube, and the rolling process continued in the same manner until the metal cover is rolled down tightly upon the outside of the tube and the degree of thickness of the covering sought for is obtained. After this, the mandrel is removed and the compound tube finished according to the usual method.

A Shell of Tinned Steel Inserted in an Iron Kettle.

In the same direction of improvement with the above, we have the statement that an English inventor has patented a process for lining hollow ware in a superior manner without increasing the cost of manufacture. This invention consists in substituting a steel-tinned lining, either spun or cast, in the iron pan, instead of the ordinary process of tinning or enameling. It is claimed for the new method that it effectually prevents the appearance of any sand, or pin-holes, or roughness, so that the interior of the saucepan will present a smoother and brighter appearance than can be secured under previous methods of manufacture. The costly process of burning and annealing can be dispensed with in operating this process. It is intended to apply the process to lining articles with brass or copper instead of tinned steel, thereby producing what is to all practical purposes a copper or brass pan at the same price as an ordinary tinned one.

A PROMISING RAILWAY INVENTION.—What may possibly become a useful device in railway locomotion is alluded to as follows: An interesting invention is now undergoing thorough investigation which promises much for the improvement of railway traffic, both in increasing the safety of railroading and the pulling capacity of a locomotive. The invention consists of a small dynamo and an auxiliary engine placed upon the locomotive in such a way as to be easily operated, furnishing a current of small force but large quantity, which is made to pass from one pole of the dynamo to one pair of driving wheels, thence along the rail to the other pair of driving wheels, thence to the other pole of dynamo, thus forming a traveling circuit, moving at all times with the locomotive. By means of this circuit an incipient weld is caused between the wheels and rails at the point of contact, preventing the slipping of the wheels. The working model of the device it is said, shows a very large increase in the hauling power of the locomotive. The model, without the application of the current, would not mount a grade of 15 per cent, but when the current was applied it mounted a grade of 35 per cent. A locomotive is now being equipped with the invention to test it on the Baltimore & Ohio railway.

ONE OF THE LARGEST ENGINES IN THE COUNTRY, which is working in a Pennsylvania sink mine, recently came to grief in a very sudden manner. The engine was known as "The President." While the engine was working and connected with an extra pump, one of the two large walking beams which connect the engine with the pumps broke in four pieces and the powerful piece of machinery came to a sudden halt. The broken walking beam weighs 24 tons, and is the largest in the country. When the engine was set in position some years ago, it required a team of 42 mules to haul each of the walking beams from the Union depot over the mountain to Friedensville. The builder of the engine was hastily summoned to the mine to repair the broken beam. Efforts will be made to put it in temporary use while a new one can be obtained. In the meantime the great mine is rapidly filling up with water.

RAWHIDE NOISELESS GEARS.—We have already made reference to the invention of noiseless rawhide gears. It is now reported that a company has been organized to manufacture gears under this patent, and that the company has announced to the mechanical world that they have succeeded in producing that which has been so long and vainly sought, strictly noiseless gears, as strong and durable as iron. The statement at first was not easily credited. Time, however, which tries all things, has, it is said, conclusively verified their claim. Their patent rawhide gears are now in general use on electric roads, and by many prominent builders of machinery throughout the country, and the demand for them is steadily increasing. They are made of solid rawhide from the huts of steer hide exclusively, used by patent process, which removes all

useless matter, condenses the hide, and entirely obviates shrinking. It is claimed that these gears will transmit fully as much power as iron gears of the same size. They can be run together or against metal gears. There are no plates, collars, bushing, bolts nor metal in any form used.

Mushet's Special Steel.

This steel, so deservedly popular among those who perform work on metals that is severe on tools, was introduced into the United States about 20 years ago, and quickly gained favor among machinists. It is particularly noted for hardness, endurance and uniformity, characteristics that have never been successfully imitated, although attempts to that end have been very persistently carried on. With tools made from this steel, machinists are enabled to run their machines at a greatly increased rate of speed, and thereby turn off a very much larger amount of work in a given time than it would be possible to do with any other known steel.

The steel is made by a secret process, which produces the peculiar hard and uniform characteristics of the material. The results obtained appear to be due to manipulation alone, for the most careful chemical analyses fail to indicate wherein the Mushet steel differs from many other brands of good tool steel. The steel certainly holds a very unique position among metals in respect to its constructive properties and its well-known economic advantages. We must confess that the former interests us most, and in this connection we recall to mind the recent words of a scientist to the writer: "We may analyze the forces of nature and to some extent harness them to our use; but could we combine them, we should be gods and not men."

This want of combination is the principle that has prevented any really successful imitation of the "Mushet's" steel; the want of combination in which the elements have especial reference to order, place and adaptability, without which the material becomes, comparatively speaking, a mere agglomeration. This idea is proved and forced upon us by the fact that many honest efforts have been made to make steel like the "Mushet's," the results of which have been that while self-hardening has been attained, the displacement of elements has been such as to greatly impair its effective service, and just at this point all imitators of "Mushet" are at sea!—*Natural Gas and Locomotive Builder.*

THE RELATIVE TEST OF NEW AND OLD METAL.—The fatigue of metals under continuous strain has long been a subject of discussion. *The Electrician* of London, in a recent report on the subject, says: "A square iron link 12 inches wide, 1 inch thick, and about 12 feet long, was taken from a bridge at Kieff, then about 40 years old, and tested against a similar link which had lain unused in store ever since the building of the bridge. The means of comparison was, therefore, excellent, and the result should go a long way to show whether or not iron really does lose any of its strength in prolonged service. The effect of the tests was to determine for the old used link an ultimate tensile strength of 21.8 tons per square inch, an elastic limit of 11.1 tons per square inch, an elongation of 14.05 per cent, and a contraction of 17.35 per cent at the point of fracture. For the unused link the tensile strength was found to be 22.2 tons per square inch, with an elastic limit of 11.9 tons, and elongation and contraction at fracture of 18.42 per cent and 18.75 per cent respectively. The two pieces of iron were, therefore, of practically identical strength; for the small difference actually observed is well within the ordinary range of variability of similar pieces of the same metal."

CHAIN IRON.—The first requisites of a high-class chain iron are well understood to be elasticity, combined with excellent welding qualities and a reasonably high tensile strength, so that the chain made from it may be in the best possible condition to resist the sudden shocks and strains to which cranes and other chains doing similar duty are continually subjected. A brittle iron possessing merely the quality of resisting a high tensile strain, steadily applied, as in a testing machine, is utterly unfitted for use in a high-class chain, since being defective in the quality of yielding by its elasticity to shocks, and readily recovering itself without fracture, it fails, by breakage, with a suddenly applied strain, which an elastic iron will support without detriment. The principle of submitting all chains to the additional test of sudden shock or jerk from a falling weight, or similar method, would be an excellent means of ensuring a proper quality of iron being used in its manufacture.

THE LARGEST GUN EVER MADE BY KRUPP is the property of the Russian Government. It is made of cast steel, and has a barrel 40 feet long, with a bore of 13½ inches. It costs \$1500 to fire a single shot from the gun.

It is stated that the wear and rusting of the steel rails amount in weight in a given time to just about opposite proportion to the tensile strength of the metal.

The portion of a locomotive the most subject to wear is the crank pin, its life being 60,000 miles; 66,733 will constitute the life of a 33 inch wheel.

SCIENTIFIC PROGRESS.

Study and Utilization of the New Metals.

Prof. W. C. Roberts-Austin, in his address at the recent meeting of the British Association for the Advancement of Science, mentioned the great importance of extending the use of the less-known metals. Attention is now concentrated on the production of aluminum, which is being turned out in considerable quantities by methods that will doubtless soon lead to a rapid increase in the number of metallurgical processes. Sodium is growing in importance, not only in cheapening the production of aluminum, but as a powerful weapon of research. Forty years ago, magnesium was a curiosity; now its production is a considerable industry. We may expect to see barium and calcium produced on a large scale as soon as their utility has been demonstrated. Minerals containing molybdenum are not rare, and the metal could probably be obtained as cheaply as tin if a use were found for it. The quantities of vanadium and thallium, which are available, are far from inconsiderable; but we know little of the action of any of these metals when alloyed with others which are in daily use. The field for investigation is vast indeed, for it must be remembered that valuable qualities may be conferred on a mass of metal by a very small quantity of another element. The useful qualities imparted to platinum by iridium are well known. A small quantity of tellurium obliterates the crystalline structure of bismuth; but we have lost an ancient art which enabled brittle antimony to be cast into useful vessels. Two-tenths per cent of zirconium increases the strength of gold enormously, while the same amount of bismuth reduces the tenacity to a very low point. Chromium, cobalt, tungsten, titanium, cadmium, zirconium and lithium are already well known in the arts, and the valuable properties which metallic chromium and tungsten confer upon steel are being generally recognized; but as isolated metals we know little of them. A reward awaits the chemists who shall raise alloys from the obscurity in which they are at present left.

The Origin of Tornadoes.

Nothing is more justly dreaded, nor more mysterious in its origin, than the tornado. Its excessive violence, the narrow limits within which the winds whirl around, and their sudden coming and short stay, deepen the mystery attached to the tornado; and while much has been written of these visitations, it has been rather a description of their appearance and of the havoc wrought by them than an explanation of their character and movement. The theory by which the tornado has been generally explained ascribes to it the whirling ascent of a mass of inflowing air from all sides, the effects being complicated by the combination of the whirling with the progressive advance of the vortex.

William M. Davis points out that tornadoes do not only whirl, but they nearly all whirl from right to left or "against the sun." This movement, he argues, cannot, therefore, be accidental; it must be regulated by some controlling antecedent—an inheritance from some preceding condition. It has been made clear that tornadoes are generated within the area of the large cyclonic storms to which we owe our spells of cloudy, rainy weather. These cyclonic storms are areas of low barometric pressure, with their winds moving in great inward spiral currents, and always, in our hemisphere, turning from right to left. When a subordinate whirl is set up in a larger whirl, the little one will begin to turn in the same way that the larger one is turning. Our tornadoes, therefore, whirl because the parent cyclones in which they are bred also whirl, the turning in the same direction being a clear case of inheritance—the offspring taking after the parent.

But if the tornado have inherited the habit of whirling from the cyclone, from what ancestor did the cyclone receive it? The fact has been discovered, through data gathered in all parts of the world, that our cyclonic storms march in an irregular procession around the north pole, along with the great north polar whirl of the terrestrial winds. If the great polar whirl should stop, the cyclonic storms also would almost disappear; but this it would be well nigh hopeless to expect.

Continuing his questions, Prof. Davis asks how the polar whirl came by its persistent habit, and answers that the earth, the moon, the sun, Mars, Jupiter and Saturn all turn from right to left. Astronomical speculators have supposed that all the planets once existed as rings of thinly scattered matter around the sun, and that these rings were annular segregations from a vague, irregularly scattered mass that turned one way in spiral courses, thus determining the direction in which the rings revolved, and all the rest from this. But why did nebula turn? It grew from chaos; and chaos possessed, presumably, some motion turning from right to left, and from that time to this, through sun, moon, planets, winds, cyclones and tornadoes, the habit then established has never been changed.—*Exchange.*

INTERESTING DISCOVERY.—Some very interesting remains of an early dwelling-place have recently been discovered a few feet above tide water at Wolfville, Nova Scotia. The discover-

ery was made by removing about six feet of sand from the top of a little hillock. In digging away the sand, the workmen came unexpectedly upon what was evidently the remains of a house. The relics unearthed were as follows: A floor of hewn boards, probably hemlock, charred on upper side; rough bricks or irregular pieces of clay reddened and hardened by fire; charcoal, or charred wood, and sticks which may have been wattles; iron implements, as wrought nails, file, knife, and portions of vessels; copper coin and gun guard; small pieces of crockery, a bowl of clay pipe two inches high, and several stems. There was evidently a small house here at some remote period, which was hurried down, and the site of which has since been covered by six feet of sand. The remains were undoubtedly of very early origin; but it is difficult to say whether they belong to the Acadian or Norse period.

HOW MOUNTAINS WERE MADE.—Foremost in their geographical importance, and in the intricacy and significance of their geological structure and origin, according to Professor Warren Upham, are the mountain belts, which consist of folded rock formations. The strata forming the upper part of the earth's crust are bent up and down in long, nearly straight or curving, wave-like ridges and troughs, and where their disturbance was greatest, the successive ridged folds are closely pressed together. The waves of the rock structure are then pushed to such steepness that their sides become parallel with each other, and the entire fold is driven forward into an inclined position. The order of the strata on the lower side of the appressed fold is thus inverted; the originally highest and last formed deposits there lie beneath older beds, in an overturned series. Subsequent erosion then wears down the undulations and the crests of the closely formed strata, often planing them off until a long section, crossing mountain ranges, passes from older to newer beds, and onward from newer to older, in several alternations, having throughout the whole a nearly constant steep dip. Owing to the interbedding of hard and enduring sandstone, quartzite, gneiss, and other rock formations, with more easily eroded limestone, shales, incoherent sandstones, or schists, the erosion commonly produces a new topography, making hollows and long valleys where the more erosive beds have been removed, and leaving ridges and mountain ranges of the harder rocks. Moreover, when erosion has been continued through very long periods, it tends toward the ultimate result of removing the upward curved or anticlinal portions of the great folds, and sparing the originally lower downward curved or synclinal portions, until valleys take the places which were originally occupied by the highest upheavals, while the original troughs, where the rocks were most compact by pressure, remain now as the principal mountain ridges.

ASTRONOMICAL PROGRESS.—In his recent address as President of the British Association for the Advancement of Science, Dr. Williams-Huggins stated that it is now some 30 years since the spectroscopic gave us for the first time certain knowledge of the nature of the heavenly bodies, and revealed the fundamental fact that terrestrial matter is not peculiar to the solar system, but is common to all the stars visible to us. This instrument has in this time analyzed the stars, though it has thus far failed to interpret the remarkable spectrum of the Aurora Borealis, and to teach much of the physical and chemical nature of the sun's corona. It has shown reasons for arranging the stars in a series in which the different temperatures seem to be indicated and to denote different stages of evolution, our sun occupying a place near the middle of the series. It has given us a means of determining that some stars are approaching and some receding in the line of sight, and of measuring the rate, though the nearest star is so remote that its approach at the rate of 100 miles per second would not increase its light one-fortieth in a century. The motions of about 50 stars have been thus determined, with an accuracy of about an English mile per second. Indeed, a number of measures of the star Arcturus have been made by Keeler, with variation of not more than six-tenths of a mile per second, these being determinations of the motions of a remote sun by means of light waves which have been nearly 200 years upon their journey. Nebulae have been seen to move at about the same rates as the stars—from two to 27 miles per second, and in one case 40 miles. Photography, which has rendered wonderful help to the astronomer in other ways, has aided in these researches.

ELECTROLYTIC BLEACHING.—A method of electrolytic bleaching has lately been patented in Germany, which consists in passing the textile or other material to be bleached between rolls serving as anode and cathode respectively, the electrolyte being used to saturate the fabric itself. Several pairs of rolls can be used, the anode and cathode being alternately the upper, so that both sides of the stuff are subjected to the bleaching action of the products of electrolysis.

NITRATE OF POTASH, called saltpeter, is said to hold in one volume as much oxygen as 3000 volumes of ordinary atmospheric air. Hence it has been called "a magazine of oxygen in a solidified form."

LIGHT IN DEEP WATER.—Clear summer sunlight is said to penetrate the Mediterranean sea to a depth of 1200 feet.

ELECTRICITY.

Electricity in Mining.

The introduction of electric devices into mining work is making rapid and most satisfactory progress. Mr. Edison is just at this time, among the multiplicity of his other labors, giving much attention to the benefits which can be obtained from electricity in this direction. In regard to the general advantages of the use of electricity for furnishing light and power in mines, there can be no question. Such use of this new power is applicable to every kind of mining.

But the especial researches of this distinguished man, at the present time, are being directed to the treatment of iron ores. He was recently in Chicago, and in reference to this matter is reported to have said:

"Electrical mining is making progress. We have invaded New York State; we have leased from the Reading road the great iron-ore deposits of Canopus valley, near Peekskill; we have purchased from Senator Jones of Nevada the small railroad, six miles long, running up the valley; we are extending it for miles, and are building concentrating works for purifying by electricity the large bodies of poor iron ore. The ore is of a poor grade, but there is an enormous deposit of it, and, though, it is too low in grade to pay for working it direct, by working it through our process we will make it all right.

"This electric mining is my biggest scheme. It is a tremendous change in the methods of separating iron ore. Under our process we find that the yield is enough to pay.

"One and a half million tons of this class of ore are imported annually from Spain, Algiers and Cuba. We must pay about \$4,000,000 or \$5,000,000 every year to Spain and Cuba for that ore. What is the use? We have got it right here. All it wants is sand to go ahead and get it out."

These statements, coming from such a source, is a matter of great interest everywhere, and in no other locality is it of more interest than in California. We have here some of the finest bodies of iron ore in the world. They are found in almost every portion of the State, easily accessible, of high percentage, and of just the character most needed under the present systems of iron production and use.

The Fresno *Expositor*, in alluding to the iron-ore deposits in that county, and of Edison's new electric process, says:

"There is no county in California, or in the whole United States, that should hail with as much enthusiasm such an invention as this, as Fresno county. It has everything to gain. From its peculiar condition, it must look to electricity as a developer of mines with more than ordinary solicitude. The great iron deposits of the Minarets are not surpassed in the world. Not even are they equaled. The iron mountains of Norway and Sweden, which have been the source of supply for the commercial world for so long, do not surpass, and it is a question if they equal the iron that forms the range of conical peaks, known as the Minarets, on the head of the San Joaquin river."

That paper further adds: "The two great drawbacks of the development of these deposits of ore have been, first, that fuel for smelting and refining has not been plentiful, and would be expensive. The second has been, that the grade of the ore is so high that it does not work easily. It is of so high grade that in the ordinary furnaces it is refractory; the iron does not flow freely from the ore."

Mr. Edison's process, if his reports can be depended on, remove both these objections. Cheap electricity, developed by water power, furnishes a substitute for the coal, while the electrical treatment separates the iron from the ore, without the drawbacks presented when that same ore is treated in an ordinary furnace with coal. If the statements of Mr. Edison, made in connection with his own special field of research, can be relied upon—if electricity can be made to do the work of coal, and do it cheaper and better, it means a great thing for California and the world.

LONG-DISTANCE TRANSMISSION is about to be tried in Los Angeles county. The San Antonio Light Power Co., near Pomona, will obtain 800-horse power from the Pelton water-wheels, which will be run by water dropped from a height of 360 feet. The power will be transmitted to Pomona, Chino, Ontario and San Bernardino, a distance of nearly or quite 40 miles. This will be considered quite a long distance transmission. The report of percentage of power transmitted over that distance will be looked for with much interest.

THE SOUTHERN PACIFIC will soon try its canny hand on an electric street railway in Oakland. The horse-car line on Telegraph avenue is to give way to an electric road which will be constructed on the most improved plan. The Southern Pacific will own and manage the road, which will be constructed at once. The contract has been let to the Pacific Improvement Co., and this fact alone will insure a speedy completion. An improved rail will be used, which will have flanges on both sides, which it is claimed will constitute an important improvement over the old one-flanged rail, which does so much damage to buggy wheels. It is expected that the road will be running within six

months. The new arrangement will afford more frequent trips and better time, and will have a tendency to increase the value of property all along the line, and make it one of the most popular thoroughfares in Oakland.

Edison's New Electric Railway Device.

The announcements from Mr. Edison of what he has done, or is confident he will do, come so thick and fast that it is difficult for the public mind to keep pace with his work. It is even more difficult to realize the possibility of some of his promises and prophecies; but he seems always to get there and on time.

His last announcement, quite recently made, and already alluded to in these columns, appears to be the most wonderful and far-reaching in its results of any of his previous remarkable discoveries. It is said that he has been engaged on experiments in this direction for two years. He has met with almost insuperable difficulties, but he has stuck to his work with that dogged pertinacity for which he is famous, and at last has been successful.

The general principle of the invention, which is applied to street cars, is that the electric current passes down through one line of rails, is picked up by the car, passes through the motor beneath it, and goes out on the other side and returns through the other line of rails to the central power station.

At the first thought, says the New York *Herald*, the bare idea of this is paradoxical. The question will naturally occur why the electric current does not dissipate itself in the ground. To this no positive reason can be assigned, except the bare statement that it does not. In general terms, the effect is accomplished by having the current one of low voltage or pressure. It is a well settled principle in electrical research that the higher the voltage the greater must be the insulation, and that the lower the voltage can be brought the less need of insulation. Mr. Edison's experiments have all been in this direction—that is to say, in the endeavor to construct a motor sufficiently powerful to do the work, in which the voltage was reduced to so low a point that the natural tendency of the electric current to fly off to the ground and be dissipated would be overcome, and the passage through the motor to the opposite rail would be easier for the current than to pass through the ground to the central station. The voltage is very low, less than 100, while the average voltage of the overhead trolley system is generally in excess of 500.

It is this system which mainly contributes to the success of the long-distance transmission at Frankfort. These two experiments will give some idea of the great revolution in electric transmission and propulsion which is about to be introduced into the use and manipulation of this new power.

One of the most remarkable features of the invention is in the "pick ups," that take the current from one line of rails. A novel and ingenious mechanism has been so arranged that it will work with perfect certainty and effect through several inches of mud or slush or water.

The experiments leading to this result were made on a track a quarter of a mile in length, which presented all the various kinds of difficulties that actual use would encounter. A part of it was laid on a very heavy grade of nearly 300 feet to the mile, with several sharp curves, and a portion of it runs through a sunken spot where the track could be flooded with water or covered with mud. In this way, all the varying conditions of actual use were provided.

The experiments have now been fully completed, and the invention passes out of the first experimental stage into the second stage, its adaptation to practical work. Several prominent horse railroads have offered their lines to the Edison General Electric Company for the introduction of the invention, and it is probable that a selection will be made in the near future and arrangements made to put the first practical experimental line in operation.

ELECTRIC ENGINEERING AT BERKELEY.—A chair of electrical engineering at the University of California, Berkeley, is being arranged for by Prof. Hesse of the Mechanical Engineering Department. Several of the students have made great progress in electrical work, all of the telegraph instruments used by the signal corps—a fire-alarm circuit and system of electric bells for calling off recitation hours—being the work of the students.

FROM SAN JOSE TO LOS GATOS.—Mr. F. Chappelle and others have presented a petition to the Los Gatos Town Board for a franchise for an electric railway, to connect with their Haywards and San Jose line in San Jose. They propose a 15-cent fare to San Jose. The petition will undoubtedly be granted, as it will prove of great convenience in more frequent and much cheaper transport between those two important points.

THEODOR MEETZ of Alameda, who contemplates changing his horse-car line to an electric road, will wait to see how the storage battery motors on the Oakland Eighth-street road work before deciding upon the method of electric propulsion which he will adopt.

LATE DEVELOPMENTS in electro-photography indicate that it may be possible to take photographs of views located many miles from the camera.

GOOD HEALTH.

More About the Leucanthemum.

We have received the following note from a prominent medical writer in New York in regard to the use of leucanthemum for sour stomach:

EDITORS PRESS.—I wonder that Geo. F. Waters did not tell your readers that the famous cure for sour stomach, the leucanthemum, was only the common oxeye daisy found almost everywhere. It would have saved them the trouble of writing to him. He might have added that chewing a bit of a soft pine stick will give the same result. It is the chewing and swallowing of saliva, an alkaline secretion, which counteracts or neutralizes the excessive acid of the stomach, that does the good.

M. L. H.

WHY IS IT BETTER TO BATHE JUST BEFORE GOING TO BED.—Cold water is a narcotic, as alcohol is, says Dr. Robert Walter, in "Laws of Health." It deadens the sensibilities of the skin, and hence prevents the sensation of cold. It relieves the disposition to chilliness because of this deadened sensibility, and as colds and catarrhs are due to hyper-sensitiveness of the skin, we readily see that the cold morning bath prevents the cold by reducing the sensitiveness; but the cold morning bath does something more. It arouses nervous activity by calling upon the vital system for increased animal heat. The contraction of the vessels due to the cold is followed by a relaxation of them, explained by the principle of reaction, and so through the cold both action and reaction are established, which frequently give delusive excitement to the victim. The tepid or warm morning bath is a great improvement over the cold water bath, but even these are not to be commended. Whoever would enjoy the best of health should take his bath two, three or four times a week, and retire to bed for a rest, thereby allowing nature to secure the best equilibrium of her force and promote the best conditions of health. But no bath should be taken while the patient is weary from labor or excitement. Rest is then indicated. The bath should never be taken on a full stomach nor immediately before a meal, as further power is needed for other purposes under such circumstances.

MEDICAL TRAINING FOR BUSINESS.—A correspondent of the *Medical Age* says: "I have endeavored to keep track of one hundred of my medical friends after graduation, especially of what they did during the first five years, and find nearly 75 per cent had to resort to other employment to make a living. Twenty-three received a salary either in addition to practice or separate therefrom. Fifteen were proprietors of drug stores. Three were insurance agents. Four loaned money. One sold real estate. Three were connected with medical journals. One was an agent for drugs. One was an agent for books. One preached. One was in the patent-medicine business. Two were farmers. One was a manufacturer. Two gave massage treatment. One sawed wood and subsequently suicided. Twelve gave up in disgust, and one never tried practice at all. Twenty-nine graduates only in one hundred exclusively devoted themselves to medicine, and of these eleven associated themselves with other practitioners, and in many cases fell heir to their practice."

GOOD EYESIGHT OF INDIANS.—Dr. L. Webster Fox is of opinion that savage races possess the perception of color to a greater degree than do civilized races. In a lecture lately delivered before the Franklin Institute, Philadelphia, he stated that he had just concluded an examination of 250 Indian children, of whom 100 were boys. Had he selected 100 white boys from various parts of the United States, he would have found at least five of them color blind; among the Indian boys he did not discover a single case of color blindness. Some years ago he examined 250 Indian boys and found two color blind, a very low percentage when compared with the whites. Among the Indian girls he did not find any. Considering that only two females in every 1000 among whites are color blind, he does not think it surprising that he did not find any examples among the Indian girls.

A NEW METHOD of producing local anesthesia has been tried in Germany, with such complete success that a boy watched, unmoved, while a deep incision several inches long was made in his thigh. The part to be operated upon is rendered insensible by cold, but instead of relying a direct application of the cold-producing agent, is touched by a metallic chamber or tube which is cooled by the evaporation of carbonic acid. The temperature may be regulated by simply turning a tap from that of cold water to one so low as to cauterize. A slight burning is experienced when the tube is first applied, and this is quickly followed by anesthesia, which lasts from one to two minutes and leaves no ill effects. The cold may be used for cauterizing and offers the advantage of producing anesthesia at the same time.

SMOKE A BLESSING.—Smoke is finding its champions in England, notwithstanding the efforts made to prevent its diffusion in the atmosphere. It is claimed that the carbon in the smoke is a powerful deodorizer, and as such is a blessing rather than a nuisance.

USEFUL INFORMATION.

How to Use a Telephone.

A reporter of the St. Louis *Globe-Democrat* spent an hour recently in the operating-room of the St. Louis Telephone Exchange, and an entertaining article was the result. The following extract relates to the use and abuse of the telephone:

There were people who could be heard saying one words because they thought they had not sufficiently prompt service, though they had no reason to do so, and if they had just glanced at the rules hanging up by their instruments, they would have seen that they were very much out of order. That is one thing about the telephone. People feel about as safe in saying cross and bad things over the wire as they do by mail. They say things that they wouldn't begin to say face to face to a lady or to a man who happened to be bigger than they. They also say cross and bad things with such perfect recklessness as would indicate that they have an idea that the wire softens the words and causes them to have less effect on the other's feelings. The feelings of these servants of the public are just as easily hurt, however, as any other's. They cannot see the person who wounds them; they cannot tell who he is unless they have answered so many calls for him that they know his voice; but they know the number of the instrument, and that same voice is not liable to get any better treatment than he deserves on the next call.

Remark has been made about the ignorance of people using the telephone. This is not only applied to occasionals, but to those who use it regularly. Abundant evidence was had of this. One man gets right close up to the instrument and yells what he wants loud enough to be heard a square away. The next one stands away back and does the same thing. Another comes along, gets up close and comes as near whispering as possible. There is one way to talk through a telephone, and only one, and few mistakes would be made by "Central" if all users would become acquainted with that fact. That way is to stand back just a little and talk in an ordinary tone, as if you were speaking to a man a couple of feet away instead of to one three or four miles away, over a wire. Don't yell; don't whisper; simply speak in an ordinary tone and distinctly. The words are carried by electricity, not by the force of your enunciation. The instrument is not to be compared to a deaf man, but, to the opposite, is exceedingly sensitive.

A NATURAL RAZOR STROP.—There are now blooming in St. Augustine 16 plants of the agave Victoria regia species, or what is commonly called the century plant. A towering column rises out of the center plant to the height of 60 feet, but it is often relegated to the rubbish heap as worthless, for the reason that, as a thing of beauty, it has no further charms for the eye. Yet many thousands of the shavvy people of the old world utilize this shaft of the plant. They make use of it as a razor strop. Mr. W. Chambers, auditor of the East Coast Railway Line, has had one in use for many years, and it shows not the slightest defect from use. The strop is made by taking the shaft of the agave and cutting it into lengths of 12 inches. These are split into four or as many "quarters" as possible, allowing to each an efficiency of the pulp or heart of the stalk to present a surface of not less than one inch on which to strop a razor. The heart hardens in time and presents a fine, soft and naturally lubricated surface for stropping a razor. —*Jacksonville Times-Union*.

OLD CABLE CAR ROPES.—A prominent cable car line official in Pittsburgh said recently: "The ropes on cable roads are, as a rule, sold as soon as they are put in. The rope upon which we are traveling was sold several weeks ago. The old ropes are sold for inclines, elevators, etc. They are better for that purpose than if they were new. They have become so thoroughly soaked with oil and tar, and so stretched, that they are seasoned. They will never wear out on inclines or elevators, because there is no strain on them compared with that of a cable road, and they have been tested so that they may be relied on. After they have been in use a short time on the cable roads, and before they show signs of wear, they are replaced by new ones." —*Chicago Jour. Com.*

A VERY PRETTY CONCEIT.—A famous woodsman once boasted that he could find his way through a wilderness and return by the same path. Being tested, he carried with him a slender thread, which should serve as a guide for the return trip. Reaching the end of his journey, he lay down to rest. While he rested came the genius of industry and beathed upon his thread and changed it to two shining ribbons of steel. It was a railroad. Throngs of people whirled past him in luxurious cars, and he read upon the train the mystic legend: "Through Express."

BORROWING MONEY at 10 per cent to put into a business that sets about the same is like cutting off the top of the blanket and sewing it on the bottom to make the blanket longer.

ENGINE ENDURANCE.—Engine 13,993, running between Altoona and Pittsburgh on the Pennsylvania Railroad, has a record of 140,000 miles without any repairs.



A. T. DEWEY.

W. B. EWER.

DEWEY & CO., Publishers.

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W. B. EWER, SENIOR EDITOR

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DEWEY & CO., PATENT SOLICITORS.

A. T. DEWEY. W. B. EWER. G. H. STRONG.

SAN FRANCISCO:

Saturday, November 7, 1891.

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[NEW THIS ISSUE.]

Anti-Incrustation Powder—J. C. Winans.
Civil and Topographic Engineer—Mark B. Kerr.
Dividend Notice—Pacific Coast Borax Co.

See Advertising Columns.

Passing Events.

The most important local event to chronicle is the final termination of the "long strike" of the Union molders, and the complete victory of the foundrymen. The strike has lasted some 20 months, and has entailed great loss on both sides. It is now happily at an end, the molders having given up the struggle as hopeless.

A mining Congress is to take place at Denver on the 18th of this month, and a silver Congress at El Paso, Texas, next month. Both these bodies will bring to the attention of Congress the grievances of the mining community of the West.

The accident at the Anaconda mine, Montana, by which nine miners lost their lives, is one of those unfortunate affairs scarcely to be provided against, without a complete change in our system of underground supervision of the men.

The Sacramento supervisors have not yet decided to permit the Iowa Hill miners to clean up their claims, and great pressure is being brought to bear by opposing forces to prevent the permission being given. In the end these methods will bring still further sympathy to the miner's side, for their request is not unreasonable made.

The Alien Act and Mines.

When the Alien Land law was passed, the MINING AND SCIENTIFIC PRESS took the ground that it was an unfortunate thing for the mining industry in the Territories. This position we have maintained and it has been borne out by experience. The law did not apply to States of the Union, so that foreign companies could invest in mining properties; but they are prohibited by this law from doing so in the Territories. It is unfortunately the case that the foreign capitalists are more enterprising than those of our own country in putting up money to purchase and properly develop large properties in distant and scarcely populated regions. As a consequence, the Territories largely depended on English, French and German capital to open their mines and establish mining centers.

Men with valuable mining properties, they were unable to develop, for lack of capital, were compelled, after the passage of this law, to look to their own countrymen for financial aid. They look in vain, for the American prefers generally investments in stocks, where money can be made on fluctuations of stock values, rather than those in mines which can pay in dividends alone.

It is to be regretted that this is so, but it is nevertheless a fact. As a result, mining in the Territories is not so flourishing as it should be. In the call for the Southwest Silver Convention, published in another column, the "Alien Act" is especially cited as one of the reasons why investments are not made in mining properties in the Territories.

Experience thus far has proven to the mining men on this coast that English and French investors are good men to have in any mining camp. They do their work thoroughly, put up first-class plants and develop their properties in the best manner. They do not expect to work a mine out in a year or so and do not work for what is in sight alone. Development work is carried on systematically and hills are promptly paid. The older States where such investments have been made have made more money out of these foreign capitalists than the capitalists have made out of the State in the long run, and it was a great mistake to have incorporated in the Alien Act the clause which prohibits investment of foreign capital in mines in the Territories.

The Anaconda Mine Accident.

At the Anaconda mine, Montana, on Tuesday night, 20 men were on the double-deck cage ascending the shaft to the surface, a few minutes before midnight, to go to supper. The upper deck of the cage was so crowded that all could not hold on, and when between the 300 and 400 levels one fell out and his body was jammed between the floor of the lower cage and the wall plate, turning the cage to an angle and hurling eight men to the bottom, a distance of more than 600 feet, to instant death.

The engineer noticed that something was wrong and promptly stopped the engine, but receiving no signal soon raised it to the surface, when the awful catastrophe became known.

Ten men got off from the upper cage uninjured, but two were lying unconscious on the lower deck, one of whom has since died. The killed were: James O'Donnell, C. N. Evans, John Ritchie, James G. Sullivan, Patrick Mulligan, M. McEver, James Roche, W. M. Martin.

The scene at the bottom of the shaft was frightful. A 20-foot sump below the 1000-foot level, where the bodies fell, held 15 feet of water, which was dyed a blood-red color and filled with arms, limbs and a mass of mutilated humanity, which rendered it difficult to identify the bodies. In fact, of the eight bodies recovered, only one could be recognized.

Only a few days ago, the mines started up after a long suspension, and this is the fourth accident since. The men who escaped cannot account for the accident, but it is said after O'Donnell fell off and was caught between the cage and the shaft, that a guide broke, which caught in the timbers and tipped the lower deck. Most of the men killed were strangers, and only two were married. All the company's mines closed down until after the funeral.

It is stated that Mining Inspector Hogan visited the mine and says he found a piece of guide about four feet long in the camp. The shaft, he says, is one of the best in the camp,

and was not badly damaged, as the cage goes still up and down unimpeded. Hogan thought one man must have fallen off first and was caught between the south wall plate and the lower cage. This caused the cage to dip to an angle which would throw the men out. The breaking of the guide, however, he thinks was due to this jolt.

The Mining Congress.

The Mining Congress, which meets in Denver, Colo., on the 18th, 19th, and 20th inst., will have plenty to occupy its time with the silver question alone, yet many suggestions are being made for action. The mining States are arranging to send full delegations that will work for the welfare of the Western region. Among other things an imposing street parade has been provided for. Each camp or county of each State and Territory will be in line according to numerical strength, and a banner will be awarded to the camp turning out the largest number of men. The smelters and machinery-men will make street displays of floats. The Georgetown Courier says:

However, there is nothing that will prove more absorbing than the drilling contest, to which an open invitation has been extended. Prizes aggregating about \$2500 have been hung up for general competition, and those who enter the list may rest assured that the winner will be the best man in his class. Judges will be selected from practical mining men, who have a complete understanding of the fine points of such a contest.

Each team or man will be allowed 15 minutes, and if a tie results, the judges will decide how the contest will be drifted off. Four-pound hammers and five-eighths steel are prescribed for single-hand drilling, and teams will use eight-pound hammers and seven-eighths steel. Ample room will be provided for contestants, who will be free from all annoyance from the audience during the trial. If the number of entries are so great that all cannot drill together, the committee will reduce the time, so that everyone can witness the entire drilling without having to return the next day. There will be no entrance fee charged to the contest, and entries can be made up to and including November 18th.

The Southwest Silver Convention.

The prospectors, miners, mine and claim owners of New Mexico, Arizona and western Texas will meet at El Paso on December 15th to consider the silver question and the alien act. This will be a mass convention, each camp sending as many delegates as it wishes. Meetings are being held in the various towns and camps to arrange for representation at the convention. It is intended in the end to form a permanent organization.

The miners' grievances on the silver question are well known; those on the alien act are not so generally understood, and the expressions and resolutions of the convention should bring this important matter to the front for discussion and settlement. In another article in this issue the matter is referred to more at length. The call for the convention is self-explanatory of the objects, and is as follows:

To the Prospectors, Miners, Mine and Claim Owners of New Mexico, Arizona and Western Texas.

The depression that exists throughout the southwest is due to the unnatural depreciation of silver and to the evil effects caused by that portion of the alien act that prohibits the investment of foreign capital in mining property in the Territories. The object of the Southwest Silver Convention that is to convene on the 15th day of December, 1891, in El Paso, Texas, is to discuss and take steps to remedy those evils. No other subject but the silver question and the modification of the alien act will be entertained by the convention, and all attempts to prevent the object of this mass meeting of miners by the introduction of questions foreign to the principles for which it was called will be suppressed. The restoration of silver to its normal value of parity with gold, and the obliteration of an unjust discrimination against the miners operating in the Territories, will engage the entire energy and time of the assembled miners of the Southwest.

CHAS. LONGUEMARRE,
Pres. Executive Committee.F. W. EDLESTEN,
Secretary Executive Committee.

COINAGE OF THE MINT.—The coinage of the San Francisco Mint in October was \$1,800,000 in double eagles, \$70,000 in standard dollars and \$200,000 in quarter dollars. The coinage for the first four months of the fiscal year was \$7,580,000, against \$3,100,000 for the same time in 1890.

DELEGATES TO THE MINING CONGRESS.—Governor Markham has chosen as three of the delegates to the Denver Mining Congress, which will assemble November 18-20, ex-Justice Niles Searles, Robert McMurray of North San Juan and W. A. Murray of Shasta county.

The Iron-Molders' Strike Ended.

After persistently holding out the many months since March 3, 1890, the molders who left the San Francisco foundries on that date have given up the strike. When they inaugurated the strike 180 men quit work at the shops, but a good many of these men have since had to leave the city to get work elsewhere. The official announcement of the surrender of Iron-Molders' Union No. 164 was made by its President at the meeting on Monday last, in the following terms:

"In view of the fact that during recent conversations with the proprietors we have learned that they will not reduce wages nor ostracize any of the men or boys who have been engaged in the strike, and will ask no questions as to an applicant for employment being a union man or not, also that no objection would be raised to unionizing the shops if we can do so, we have decided to call a halt. This is done to prevent by all means in our power any further suffering on the part of our men and boys, and to let the public see that we were always anxious to end the warfare if given reasonable assurances that we would not be driven to the wall."

The following are the terms submitted by James Spiers and W. H. Taylor on behalf of the Foundrymen's Association, referred to in the preceding paragraph, and which were accepted by the Molders' Union:

SAN FRANCISCO, Oct. 29, 1891.—The Molders' Union having declared a strike against the shops of the Manufacturers' Association in March, 1890, without consulting with said shops, they have no advice to offer the molders as to the matter of declaring the strike off; but they reaffirm what they have always maintained, namely: That no prejudice exists against the men and boys on account of said strike should the same be declared off.

JAMES SPIERS,
W. H. TAYLOR.

This has been the largest strike ever experienced in this city, and the one which has done the most harm. The foundrymen have been put to great annoyance and expense, and the molders themselves have suffered worse. Among others, two deaths by violence may be attributed to this strike.

A curious feature is that the contest was not commenced on account of a reduction of wages or desire for an increase. The rules of the Molders' Union were very arbitrary in the matter of apprentices and amount of daily work, and no non-union men were allowed where union men worked. This latter point was stubbornly fought, but the molders will have to give it up for the future as well as other contested points.

Men were brought from the East by the foundrymen, and some work was done East. Moreover, many orders went away from here which should have been done at home. The men have done themselves and the employers as much harm as they could, and generally injured the largest branch of manufacturing industry in the State. The shops have plenty of men, as they have had for months, so that the Union had to give up the fight in the end. An immense loss of wages has been the result, and harm has been done all around. It will take the iron industry some time to recover the setback it has received in expenses and loss of contracts, etc. The Core Makers' Union has also declared the strike off. The San Francisco foundries will hereafter be run by their owners instead of by a Union with no investments in the plants. The Manufacturers' Association is to be congratulated for the firm stand it took and the successful fight it carried out.

COAST COAL REDUCED.—The coal mining companies with headquarters at Seattle, Wash., have announced a general reduction in the price of coal. The old prices were—\$6 for screened coal, \$5.25 for average, in carload lots, \$3.50 for nut, and \$2 for screenings. A new schedule has gone into effect as follows—\$5 for screened, \$4.50 for average in carload lots, \$3 for nut and \$1.75 for screenings. The companies affected by the agreement are the Oregon Improvement, Seattle Coal and Iron, Black Diamond and Cedar Mountain and the rates are the retail ones. This reduction, which affects not only the Sound consumers, but those at other points on the coast, is due to several causes, among which are the reduction of wages, brought about by the strike, and the reduction in the price of wood. Another point is that the coal companies are endeavoring to meet competition from Australia,

Cross' Electric Indicator and Overwinding Alarm.

The want which has existed for some apparatus which would, with certainty and accuracy, notify the approach to the surface of cages in shafts, and also notify to the engineer the fact that he is about to overwind, is sought to be supplied by the electric indicator and overwinding alarm.

The electric indicator is worked by a worm wheel on the end of the drum shaft moving a finger around a circular plate in front of the engineer. On the rim of the plate are the marks for the different levels, also two contact pieces actuated by the point of the finger. As the cage nears the surface, the finger completes the electric circuit, ringing a large electric bell placed in any portion of the engine-house where it may be clearly heard by the engineer. As the cage goes down the shaft, the finger lifts a spring and so avoids making contact as it passes the contact piece, and thus the bell is

stopped upon, he will not only be instantly notified of what he is doing, but a record will be left on the dial that such has been done. The instrument is therefore not only a preventive, to a measure, but is also deterrent in its operation. The engineer cannot start his engine the wrong way, for he would be made aware of it before he had thrown his engine into gear, and so have a chance of reversing at once. The battery will last about two years without renewal, and the cost is nominal. The units are taken from the last official report of the Secretary for Mines, Victoria, Australia.

Traffic Association of California.

The Traffic Association of California on Wednesday issued its address to the merchants and producers of the State. It is a plain, terse, matter-of-fact document, appropriate to the occasion, and in full is as follows:

SAN FRANCISCO, Nov. 2, 1891.

To the Merchants, Manufacturers and Producers of California:
The necessary arrangement preliminary to the

market for their products, manufactures and merchandise.

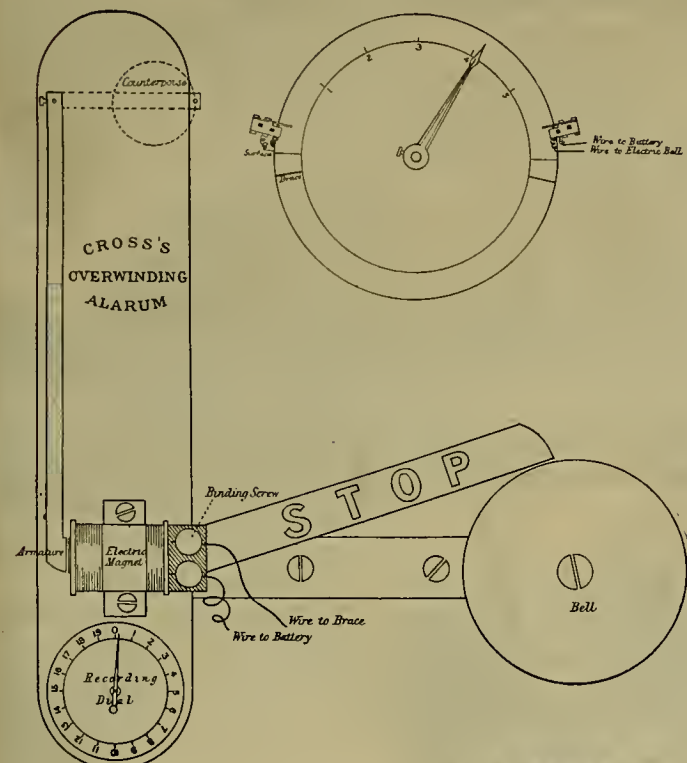
The association does not intend to confine itself to transcontinental traffic alone, but to take within its scope matters pertaining to local, coastwise and transpacific traffic, believing that through its medium the establishment of steamship lines to points hitherto not reached from this city can be encouraged, and an improved service to other points effected.

Having stated briefly the objects and purposes of the association, the committee invite all interested to become members.

- JAMES B. STETSON, President.
F. L. CASTLE, First Vice-President.
BARRY BALDWIN, Second Vice-President.
ISAAC UPHAM, Treasurer.
J. C. SIEGFRIED, of Siegfried & Brandenstein.
EUGENE B. BECK, of D. L. Beck & Sons.
ROBERT WATT, of Langley & Michaels Co.
A. W. PORTER, of Porter Bros.
B. F. DUNHAM, of Dunham, Carrigan & Hayden Co.
WM. HAAS of Haas Bros. & Co.
ISIDOR JACOBS, of A. Lusk & Co.
J. H. WISE, of Christy & Wise.
A. J. MARCUS, of S. H. Frank & Co.
A. S. HALLIDIE, of California Wire Works.
F. W. VAN SICKLEN, of Dodge, Sweeney & Co.
S. N. GRIFFITH, of Fresno.
C. T. SETTLE, Pres. Farmers' Union, San Jose.
J. A. HEDGES, of Hedges, Buck & Co., Stockton.
W. H. WOOD, of W. H. Wood & Co., Sacramento.

Folding Ladder.

William M. Peory of Jackson, Cal., has secured through the MINING AND SCIENTIFIC PRESS Patent Agency of San Francisco, Cal., a patent known as a "folding ladder." The principal use of this invention is that of a fire-escape, and its application is shown in the accompanying cut. The readiness with which it may be folded into a compact form, and stowed into small space, recommends itself for various purposes, where the use of a ladder is required. Two rigid bars or rods of iron form the sides of the ladder, which have end stops, the several rods or bars being connected on each side by an ordinary chain link. The ladder rounds are made of light tubular metal, and the side rods or bars pass freely through the ends of the rounds, being limited by the end stops on the ends of the side bars or rods. The entire ladder is light and strong, and is easily folded into small compass, each section hending at the connecting links. By the movement of the sliding rounds, they avoid interference with each other, and thereby occupy but small space. The ladder may be readily reversed, end for



A. W. CROSS'S ELECTRIC INDICATOR.

not rung until the opposite cage approaches the surface. The contact pieces are clamped on the plate by a set screw, and in the event of the length of rope being altered on the drums, the alteration of the position of the contact pieces corresponding with that rope can be made in 15 seconds. The advantage of the disc over using a coiled tape for working a weight to indicate the position of a cage is that the weather has no effect on it as it has on tape. When a chain is used, it is apt to "ride," and when alterations are required in the length of rope, the adjustment of the tape is a matter of time and experiment. The geared finger is positive in action, and alterations from level to level, so necessary in quartz mining, can be made instantly and with great precision. Where the indicator is used, it is giving entire satisfaction.

The overwinding alarm is worked from the same electrical battery as the indicator, but is quite independent of the indicator, inasmuch as it is worked by the cages themselves. Above the landing place, as many feet as may be decided upon as the safe point to which cages may be raised, are fixed on the center skid two springs, the compression of either by a rising cage completing the electric circuit with the other, and dropping a semaphore arm in the engine-house, at the same ringing an alarm bell, which continues to ring until the arm is replaced by the engineer. In the foot of the semaphore is a dial with a pointer on it. Every time the arm falls, the pointer progresses a figure, so that if an engineer is careless and allows his cages to rise above the point of safety de-

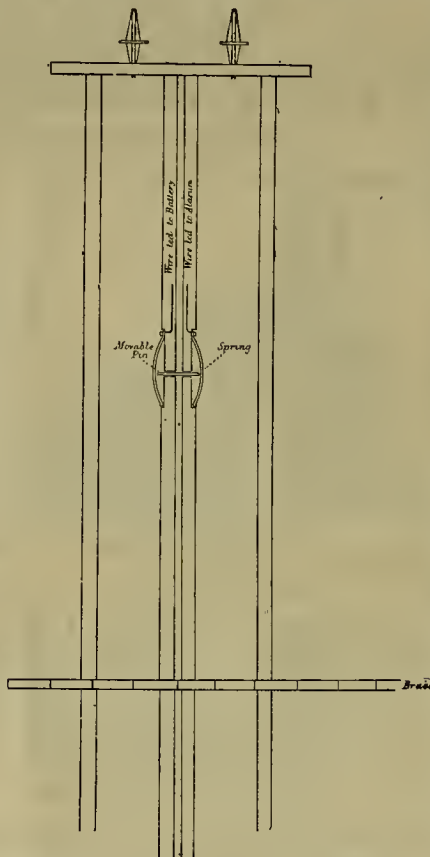
permanent organization of the California Traffic Association, viz.: The appointment by the chairman of the meeting held October 17th of an Executive Committee of 18, having been accomplished, the committee now calls for the enrollment of names of all merchants, manufacturers and producers who wish to lend their support, both moral and financial, to a movement destined to mark an epoch in the commercial history of our State of unprecedented importance.

While making this call, the committee deems it a fitting opportunity to clearly set forth the aims and objects of the California Traffic Association:

For the purpose of gain and contrary to the interest of the people of California, the great railway lines which reach this State have formed a gigantic combination, whose ramifications extend to the roads of an adjacent foreign country. This combination has subsidized the line of steamships by way of Panama, and has made its influence felt on the sailing vessels that carry freight from the Atlantic seaboard to the Pacific by way of Cape Horn.

The rates of freight have been arbitrarily determined, and in endeavoring to secure a readjustment of the same you have had to contend with this powerful combination individually and alone. To you is now offered the opportunity of placing yourselves in a position so that you may stand upon equal ground with this combination when endeavoring to bring about an equitable adjustment of matters vitally affecting our commercial existence.

It is not proposed to use the power which this association will have in a hasty or ill-advised manner; only when all negotiations fail will this association make its full power felt. By concerted action and thorough organization it is realized that much can be accomplished as regards traffic matters, which would be impossible by separate or individual and unorganized efforts. This association is not organized for the purpose of affording any member thereof opportunities for revenging himself for wrongs, real or fancied, received at the hands of any transportation company in the past. It proposes to deal with transportation companies, through its committee and commissioner, on business propositions, by business men, and it hopes by business-like methods to secure such freight rates and transportation facilities as will afford the producer, manufacturer and merchant of California an enlarged



A Neat Savings Plan.

The Nickel-Plated Banks of the People's Home.

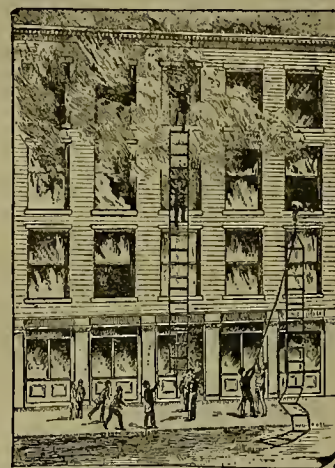
A very neat and very effective plan for accumulating a good sum of money by small savings is in vogue with the People's Home Bank, and is described in the S. F. Chronicle. The bank has a large number of small nickel-



plated savings banks, oblong in shape and about half the size of an ordinary cigar box. These banks will each hold \$35 in dimes, and their use is becoming general in this city. To get a bank you simply deposit a dollar with the People's Home cashier and take your bank home, where you drop in an occasional dime and wake up some morning to find you have \$35 of surplus coin on hand. The only way you can get at this is to take the bank to the People's Home, where the key is kept, and there unlock it. The matter of putting the money in the care of the People's Home is optional. Most of the dime-savers do so, and thus lay the foundation for a fortune. It is a very easy and very effective way to save money.

THE California Electric Light Co. of this city has sold for \$1,000,000 its plant, franchise, etc., to the Edison Light and Power Co.

ANOTHER "lost mine" has been rediscovered on the property of Wiley, Conner & Co., near Llano, Texas.



Penry's Fire Escape.

end, and the rounds will slip down to what then becomes the lower ends of the side rods or bars. This advantage is particularly present in the use of the ladder as a fire escape, for which purpose one end is connected by means of chains with any suitable portion of the window casing. When not in use the ladder will lie in small compass within the room, but when required, may be dropped out of the window, remaining fast at the upper end. The free end is provided with a hook of suitable character, this end to be raised by a pole or rod, and the hook caused to engage some point above, as, for example, a higher window-sill or the eaves. In this case the ladder is reversed; but the rounds will slip down the side rods or bars to proper position, or either end of the ladder may be raised from the ground, and the rounds will fall to proper position. These ladders may be seen in this city at the Standard Iron & Wire Works, 763 Mission street, near Fourth.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

ARIZONA MINES.	Dr.	Cr.	Dr.	Cr.
Crocker.....	\$ 135	Julia.....	10,142	
Loc motive.....	535	Justice.....	3,731	
Peer.....	\$615	Kentuck.....	417	
Peerless.....	4,719	Lady Washington.....	13,055	
Silver King.....	7,641	Mexican.....	15,073	
Weldon.....	1,376	Oce dental.....	31,173	
BODIE MINES.		Ophir.....	25,059	
Sodie.....	7,043	Overman.....	1,413	
Bulwer.....	3,886	Potosi.....	22,187	
Mono.....	4,494	Savage.....	27,048	
Standard.....	20,014	Seg. Belcher.....	7,061	
Syndicate.....	2,519	Scorpion.....	2,554	
COMBINED MINES.		Sierra Nevada.....	8,073	
Alpha.....	2,612	Silver Hill.....	5,417	
Alta.....	59	Union.....	10,274	
Andes.....	13,984	Utah.....	7,612	
Belen.....	9,023	TUSCARORA MINES.		
Benton.....	8,177	Belle Isle.....	8,177	
Best & Belcher.....	4,880	Commonwealth.....	19,219	
Bullion.....	20,720	Del Monte.....	14,706	
California.....	12,183	Diana.....	160	
Challenge.....	3,776	Graham.....	3,943	
Chollar.....	64,299	Independence.....	734	
Confidence.....	14,821	Navajo.....	20,569	
Con. Cal. & Va.....	97,947	Nevada Queen.....	16,431	
Con. Imperial.....	24,561	North Holla Isle.....	20,530	
Con. New York.....	4,850	N. Commonwealth.....	8,793	
Orova Point.....	6,222	MISCELLANEOUS MINES		
Eschewer.....	14,221	Eureka.....	64,584	
East Sierra Nev.....	378	Holmes.....	30,500	
Con. Cal. & Va. has bullion on hand amounting to \$27,483.02, with further shipments to arrive. Navajo has \$12,800 due on pumping account. Crown Point has money due on pumping account.				

ONE HUNDRED AND FORTY-FOURTH PARALLEL.—Prof. Davidson of the Coast and Geodetic Survey is contemplating a survey of the 144th parallel in Alaska, for which purpose five parties of 10 or 12 men each will be sent.

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SAN FRANCISCO:
OSBORN & ALEXANDER, 401 Market St.

PROPOSALS FOR TUNNELS

OFFICE OF THE CHIEF ENGINEER OF THE Arrowhead Reservoir Company, San Bernardino, California, October 10, 1891.

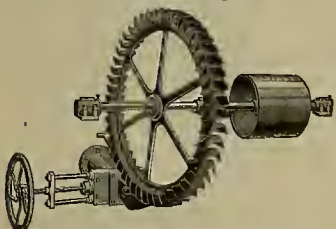
SEALED PROPOSALS
Will be received by the undersigned until noon of **TUESDAY, the 15th of December, 1891,** for the construction of three tunnels—one of about 2000 feet in length, the second about 4000 feet in length, and the third about 5000 feet in length, through rock, in accordance with plans and specifications on file in this office.

Proposals must be accompanied by a certified check in the sum of \$2000, to be returned to the unsuccessful bidder. The Company reserves the right to reject any or all proposals.

A. H. KOEBIG,
Chief Engineer The Arrowhead Reservoir Co.

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Compressed Air and Water Power Machinery.



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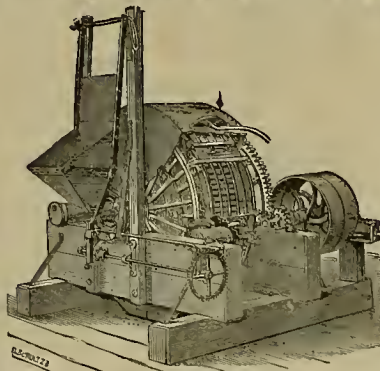
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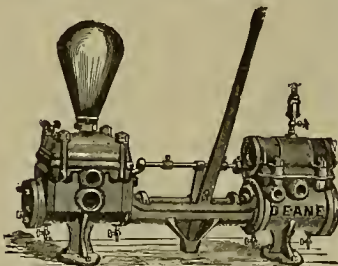
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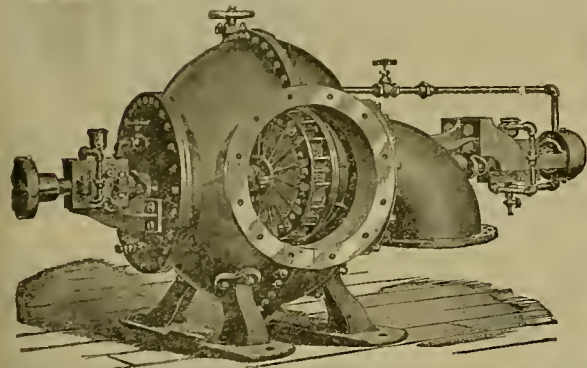
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Alta M Co., Nevada.....	40.....30c.	Oct 5, Nov 11, Dec 2.....	L O Osborn, 309 Montgomery
Bodie Cons M Co., California.....	13.....25c.	Sept 22, Nov 5, Dec 9.....	H D Walker, 309 Montgomery
Branswick Cons M Co., California.....	2.....2c.	Sept 11, Oct 8, Nov 15.....	J Stadler, Jr, 309 Montgomery
Buchanan M Co., California.....	16.....10c.	Oct 7, Nov 9, Nov 26.....	P J Sullivan, 121 Post
Bulwer Cons M Co., California.....	7.....15c.	Oct 28, Dec 4, Dec 31.....	L Osborn, 309 Montgomery
Butte King M Co., California.....	2.....10c.	Sept 21, Oct 31, Nov 17.....	W C Lewis, 725 Market
California & Arizona M Co., Arizona.....	4.....10c.	Sept 2, Nov 9, Nov 30.....	T E Jewell, 310 Pine
Chollar M Co., Nevada.....	31.....50c.	Oct 25, Nov 30, Dec 22.....	O E Elliott, 309 Montgomery
Cons Imperial M Co., Nevada.....	32.....5c.	Nov 2, Dec 8, Dec 29.....	U L McCoy, 331 Pine
Cons New York M Co., Nevada.....	5.....10c.	Sept 2, Nov 6, Nov 24.....	O E Elliott, 309 Montgomery
Del Monte M Co., Nevada.....	5.....10c.	Sept 28, Nov 3, Nov 30.....	J W Pew, 310 Pine
Eureka Cons Drift M Co., California.....	4.....2c.	Oct 26, Nov 30, Dec 12.....	D M Kent, 330 Pine
East Best & Belcher Silver M Co., Nevada.....	7.....20c.	Oct 22, Nov 24, Dec 12.....	C H Mason, 331 Montgomery
Fall River Cons Gold Quartz M Co., California.....	6.....2c.	Oct 20, Nov 20, Dec 21.....	L Cassel, 115 Front
Garden Gravel M Co., California.....	1.....10c.	Sept 17, Oct 27, Nov 17.....	N Thorne, 328 Montgomery
Gray Eagle M Co., California.....	26.....4c.	Oct 27, Nov 30, Dec 21.....	A W Barrows, 309 Montgomery
Hale & Norcross S M Co., Nevada.....	99.....55c.	Oct 15, Nov 24, Dec 15.....	A B Thompson, 309 Montgomery
Horse-Shoe Bar Cons M Co., California.....	3.....3c.	Oct 30, Dec 1, Dec 22.....	D M Kent, 330 Pine
Kentuck Cons M Co., Nevada.....	2.....15c.	Oct 25, Dec 1, Dec 23.....	J W Pew, 310 Pine
Keystone Cons M Co., California.....	1.....\$2.50.	Sept 6, Oct 21, Nov 23.....	J H Isham, 310 Pine
Kingman Cons M Co., Arizona.....	1.....5c.	Sept 30, Oct 12, Dec 1.....	T E Atkinson, 402 Montgomery
Monte Blanco Cons M Co., California.....	31.....25c.	Sept 17, Oct 27, Nov 30.....	H D Walker, 309 Montgomery
Mount El Dorado M Co., California.....	3.....10c.	Sept 18, Oct 20, Nov 7.....	A B Brady, Grass Valley
New El Dorado M Co., California.....	3.....10c.	Oct 2, Nov 6, Dec 4.....	F W Stone, 309 Pine
Occidental Cons M Co., Nevada.....	8.....25c.	Oct 19, Nov 23, Dec 16.....	A K Durbrow, 309 Montgomery
Ophir M Co., Nevada.....	57.....5c.	Oct 2, Nov 4, Nov 24.....	E B Holmes, 309 Montgomery
Orrman Cons M Co., Nevada.....	62.....60c.	Sept 25, Oct 30, Nov 20.....	E D Edwards, 414 California
Peckless M Co., Arizona.....	17.....10c.	Sept 17, Oct 21, Nov 19.....	A Waterman, 309 Montgomery
Pendsylvania Gold M Co., California.....	1.....10c.	Oct 18, Nov 23, Dec 1.....	F W Seitz, Forest City
Seg Belcher & Mides Cons M Co., Nevada.....	9.....25c.	Oct 29, Dec 1, Dec 21.....	E B Holmes, 309 Montgomery
Sierra Nevada M Co., Nevada.....	100.....50c.	Oct 6, Nov 11, Dec 1.....	E S Parker, 309 Montgomery
Silverado M Co., California.....	2.....2c.	Oct 15, Nov 16, Dec 7.....	E S Cox, Chronicle Building
Siskiyou Cons Gold Silver M Co., California.....	1.....4c.	Oct 9, Nov 12, Dec 4.....	F W Stone, 309 Pine
Utah Cons M Co., Nevada.....	13.....25c.	Oct 15, Nov 24, Dec 18.....	A H Fish, 309 Montgomery
Yellow Jacket M Co., Nevada.....	49.....50c.	Aug 31, Oct 2, Nov 7.....	W H Blauvelt, Gold Hill

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
Challenge Cons M Co., Nevada.....	Annual.....	O L McCoy, 331 Pine	Nov 19
Confidence Silver M Co., Nevada.....	Annual.....	A S Groth, 414 California	Nov 13
Hamburg M Co.....	Annual.....	J N Pike, 331 Montgomery	Nov 17
Mortimer Cons M Co., Nevada.....	Annual.....	J N Pike, 331 Montgomery	Nov 17
Occidental Cons M Co., Nevada.....	Annual.....	A K Durbrow, 309 Montgomery	Nov 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Champion M Co.....	10.....	T Wetzel, 320 Sansome	Aug 15
Cons Cal & Virginia M Co., Nevada.....	50.....	A W Havens, 309 Montgomery	Aug 17
Ophir M Co.....	30.....	F M Hall, 314 Montgomery	Sept 10
Great Western Cons Silver M Co.....	25.....	A Halsey, 328 Montgomery	Oct 1
Idaho M Co., Grass Valley.....	3 00.....	Grass Valley	Aug 4
Mayflower Gravel M Co., California.....	10.....	D M Kent, 330 Pine	Aug 20
Pacific Coast Borax Co., California.....	1 00.....	A H Clough, 230 Montgomery	Nov 10
Standard Cons M Co., California.....	10.....	J W Pew, 310 Pine	Oct 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING OCT. 15.	WEEK ENDING OCT. 22.	WEEK ENDING OCT. 29.	WEEK ENDING NOV. 5.
Alpha.....	.50	.60	.40	.50
Alta.....	.40	.45	.40	.35
Andes.....	1.00	1.10	.75	1.00
Belcher.....	1.30	1.60	1.25	1.50
Bodie.....	1.00	1.10	1.00	.90
Best & Belcher.....	2.80	3.20	2.35	2.45
Bullion.....	1.40	1.65	1.25	1.40
Bulwer.....	.40	.50	.35	.45
Commonwealth.....	.20	.30	.25	.15
Cons Va. & Cal.....	5.50	6.37	4.25	5.37
Challenge.....	1.20	1.30	1.10	1.30
Chollar.....	1.20	1.45	1.05	1.35
Confidence.....	.10	.10	.10	.05
Cons Imperial.....	.35	.40	.35	.40
Osleonia.....	.10	.10	.10	.05
Oroon Point.....	1.25	1.60	1.20	1.40
Procter.....	.10	.10	.10	.05
Del Monte.....	.45	.60	.45	.55
Eureka Cons.....	1.00	1.60	.45	.55
Exchequer.....	.45	.60	.45	.55
Grand Prize.....	.75	1.10	.45	1.25
Could & Curry.....	2.00	2.45	1.75	2.30
Hale & Norcross.....	1.80	1.60	1.05	1.95
Julia.....	.15	.10	.15	.10
Justice.....	.50	.55	.40	.45
Kentuck.....	.20	.25	.20	.15
Lady Wash.....	.20	.10	.15	.15
Mono.....	.20	.25	.15	.30
Mexican.....	2.45	2.70	2.05	2.45
Navajo.....	.10	.10	.10	.10
North Belle Isle.....	.20	.25	.20	.30
Nev. Queen.....	.20	.25	.20	.30
Occidental.....	.65	.85	.50	.60
Ophir.....	3.35	3.90	1.75	3.30
Orrman.....	1.00	1.10	1.00	1.20
Pekoa.....	2.55	1.30	1.35	2.10
Peckless.....	.05	.05	.15	.15
Peer.....	.10	.10	.10	.10
Savage.....	2.70	3.15	2.05	2.35
S. B. & M.....	.60	.65	.50	.55
Sierra Nevada.....	2.30	2.50	1.75	2.25
Silver Hill.....	.15	.20	.15	.10
Scorpion.....	.25	.25	.20	.20
Union Cons.....	2.15	2.45	1.85	2.20
Utah.....	.10	.10	.10	.10
Yellow Jacket.....	1.60	1.75	1.50	1.70

Eastern Metal Markets.

By Telegraph.
New York, November 4.—The following are the closing prices the past week:
Silver In Silver in London. New York. Copper. Lead. Tin.
Thursday.....44 95 11 60 4 20 19 90
Friday.....44 95 11 60 4 15 19 85
Saturday.....44 95 11 60 4 15 19 80
Monday.....44 95 11 60 4 12 19 80
Tuesday.....43 95 11 60 4 12 19 80
Wednesday.....43 95 11 60 4 12 19 80

Borax is strong under firm buying. Tin has a stronger tone. Lead is heavy. Copper is barely steady. Iron is in good demand from all quarters.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. O. BAILEY—San Francisco.
Geo. Wilson—Sacramento Co.
J. H. CROSSMAN—Perris, Cal.
CHAUNCEY A. DAYTON—San Lucas, Cal.
G. R. GIL—Cambria, Cal.
Wm. T. HEALD—Cloverdale.
Mrs. GERTRUDE DECKER—Fillmore, Cal.
ROBERT H. AUBER—El Cajon, Cal.
M. E. KERRY—Santa Clara County.
F. K. MERRITT—Heldsburg.
FRANK A. SWETHEER—Solano Co.
W. E. BRATTON—San Benito Co.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing a cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Sales at San Francisco Stock Exchange.

THURSDAY, November 5, 9:30 A. M.	
600 Alpha Cons.....	30c 100 Could & Curry.....1.35
100 Alta.....	.50 100 Hale & Norcross......55c
100 Andes.....	.75c 200 Mexican.....3.00
300 Belcher.....	1.05 675 Ophir.....2.55
60 Best & Belcher.....	2.35 400 Overman.....1.10
100 Bullion.....	1.05 300 Potol.....1.40
100 Challenge.....	.05 300 Savage......35c
50 Chollar.....	.8c 300 Scorpion......15c
100 Cons Cal & Va.....	.47c 300 Seg Belcher......35c
2340 Cons Imperial.....	.5c 410 Sierra Nevada.....1.40
100 Crown Point.....	1.00 300 Union Cons.....1.15
200 Exchequer.....	.35c 150 Yellow Jacket.....1.30

THE Pacific Nail Works, Oakland, have started up after having been closed down for several weeks.

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MACHINERY,

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Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 27th day of October, 1891, an assessment, No. 26, of Four (4) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately to the United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of November, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 21st day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

HORACE D. RANLETT,
Ores, Mining, and Commission,
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Ships under advances to smelting works in Boston New York, Baltimore and Liverpool.
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All business conducted on Cash Basis.
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Sales of Developed Copper Mines undertaken.
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SECTION 15, T. 23, R. 24—640 ACRES OR LESS—3 1/2 miles S. W. of Pixley, can be had at a nominal rent the first year, with preference for after years. Would give use of 160 acres or more for two years for boring a flowing artesian well. Call on L. E. Smith, Wells, Fargo & Co.'s office, Pixley, or address the undersigned, A. T. DEWEY. Also one-quarter Sec. 13, T. 21, R. 23, 9 miles S. W. of Tulare City. Satisfactory arrangements can likely be made for irrigating the latter.

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DR. LA GRANGE, OCULIST,
Office, 215 Powell St., San Francisco.
Hours, from 11 until 2. Residence, 1432 Geary St., cor. Laguna. Hours from 3 until 5. All Diseases of the Eye successfully treated by his new system without the use of the knife.

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O. S. HALEY, Secretary.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMPANY, San Francisco, October 31, 1891.—At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 11) of One Dollar (\$1.00) per share was declared, payable THURSDAY, November 10, 1891, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books will close November 5, 1891, at 3 o'clock p. m.
ALTON H. CLOUGH, Secretary.

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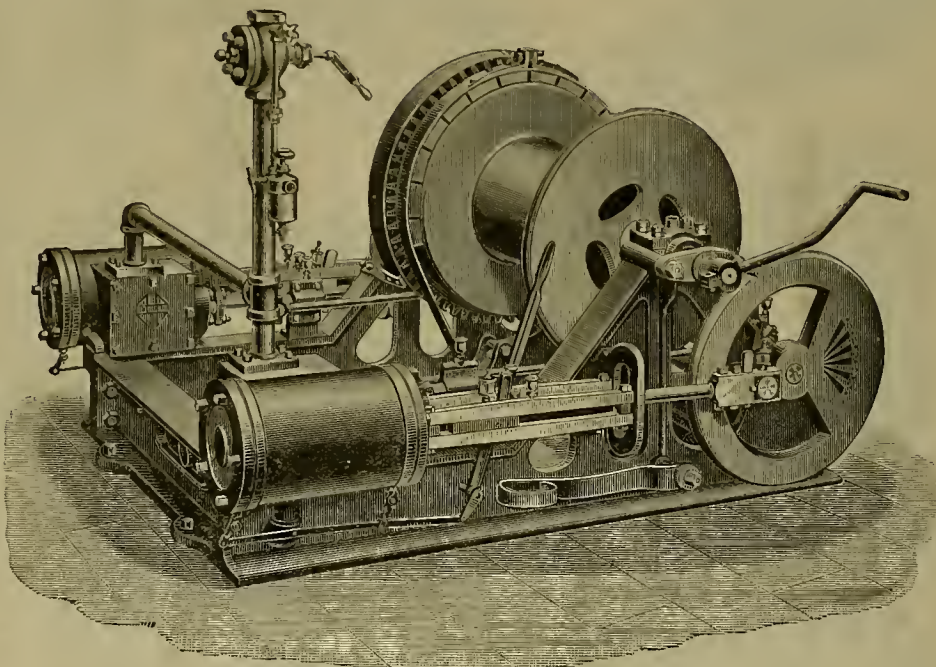
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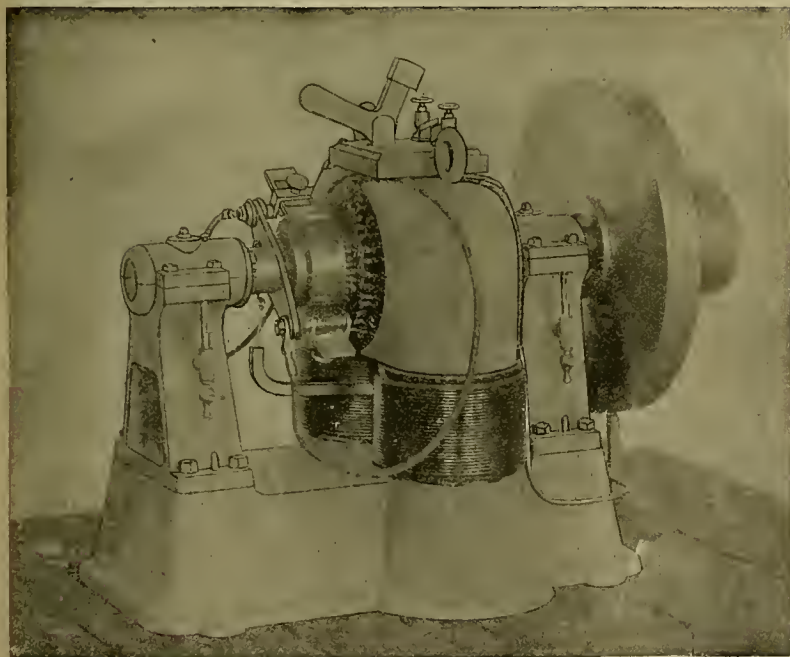


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Gold, Silver, Lead

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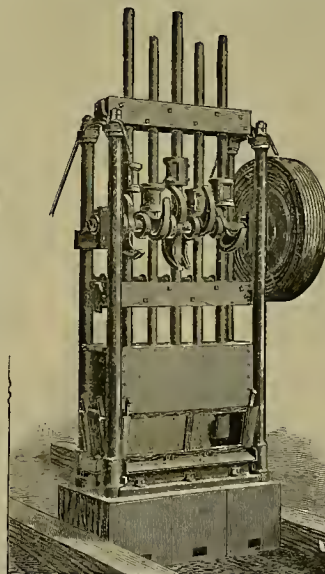
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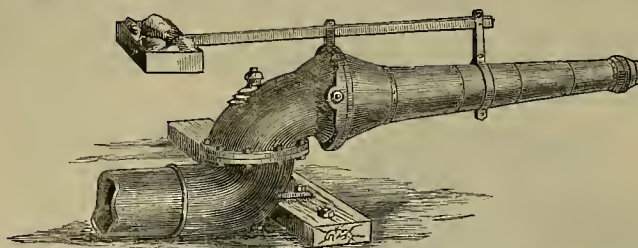
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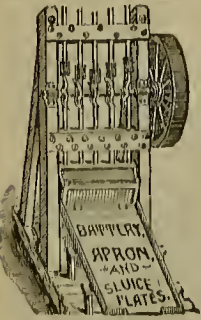
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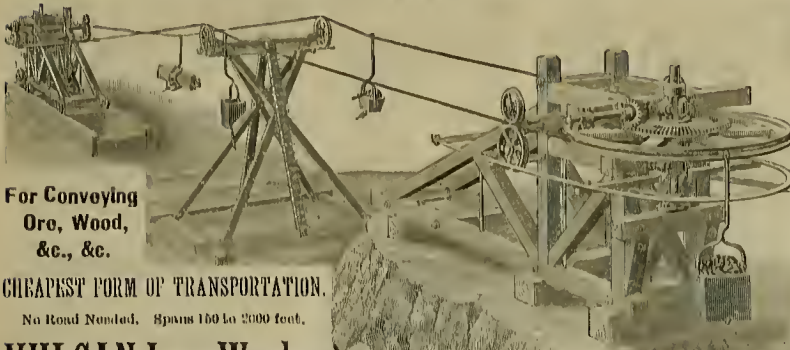
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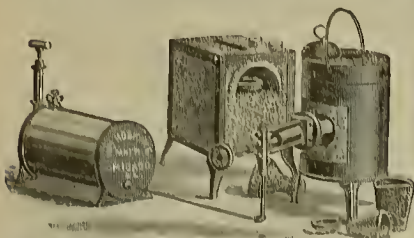
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For Water Supply, Mining, Irrigating Purposes, Stock Ranches, Etc.

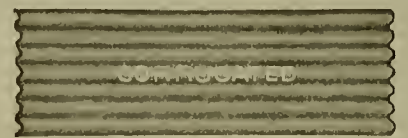
Made in Lengths Desired from 10 to 30 feet.

The Cut shows a Section of Three Joints

DOUBLE RIVETED SHEET IRON PIPE.

In the manufacture of this Pipe, we use only a high grade of annealed sheet iron of great tensile strength. The weight or thickness of metal used, is graded according to service required, and pressure to which the Pipe will be subjected.

FOR ALL UNDERGROUND PURPOSES, we immerse the Pipe in a bath containing a special mixture of ASPHALTUM, PETROLEUM and PETROLEUM, at a Temperature of 300° Fahrenheit. It thus receives a thorough coating, both inside and outside, rendering it impervious to the action of the earth, rust, etc., and is practically indestructible.



CORRUGATED IRON,

Black, Painted and Galvanized, for Roof and Sides of

HAY BARNs, DRY HOUSES, STABLES, ETC.

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First Premium Awarded at Mechanics' Fair, 1884.
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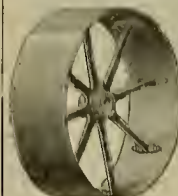
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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shafts and Crusher Plates.

THESE CASTINGS ARE EXTENSIVELY USED IN ALL THE MINING STATES and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

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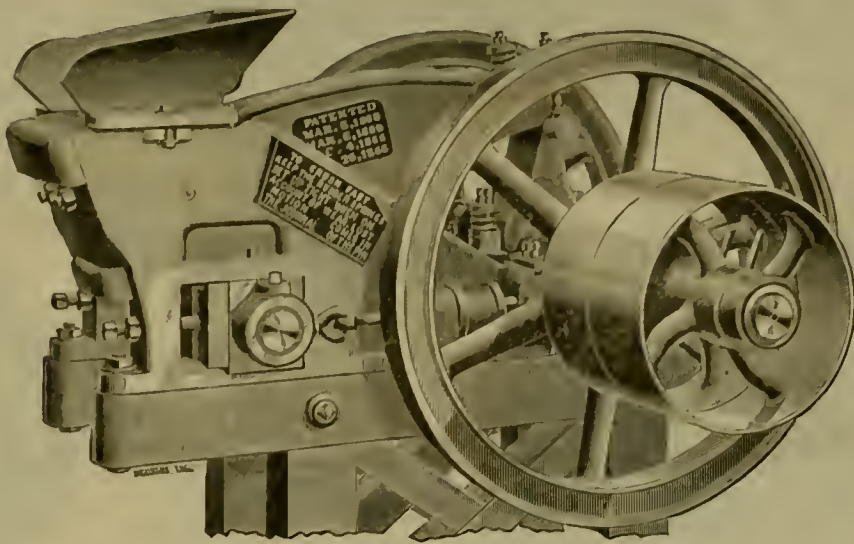
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ROCK BREAKERS,
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DODGE IMPROVED ROCK BREAKER.

INGERSOLL - SERGEANT
ROCK DRILLS,
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WATER WHEELS,
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SAW MILLS,
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MILL AND MINE SUPPLIES.

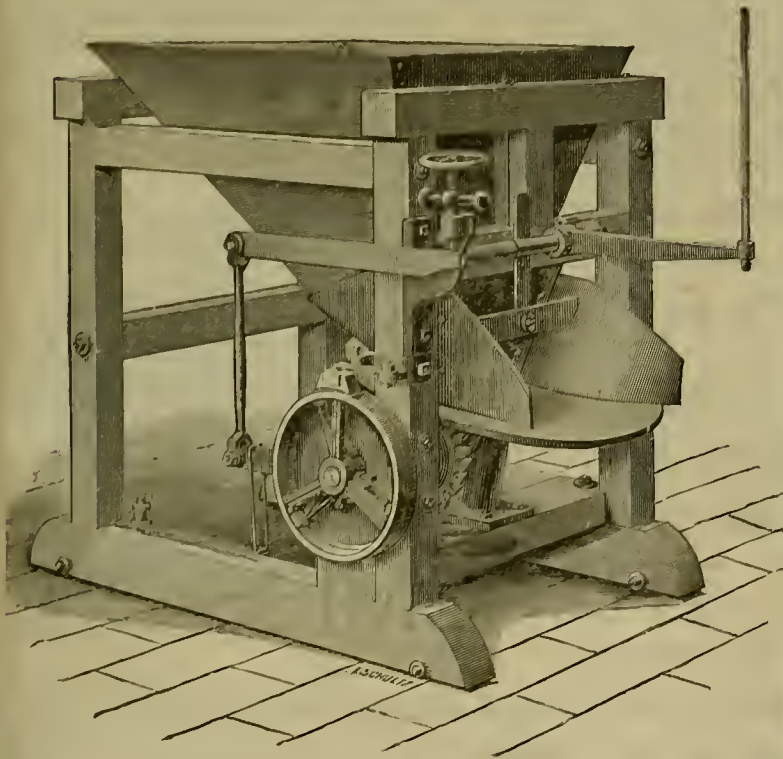
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And will furnish descriptive Catalogues and quote prices upon application.

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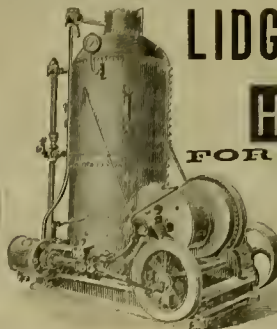
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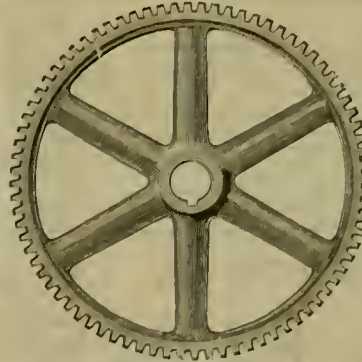
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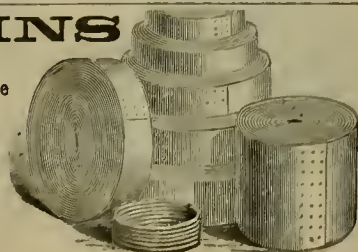
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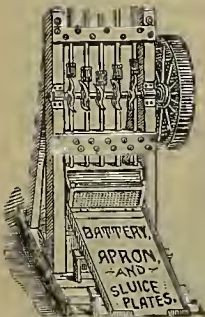
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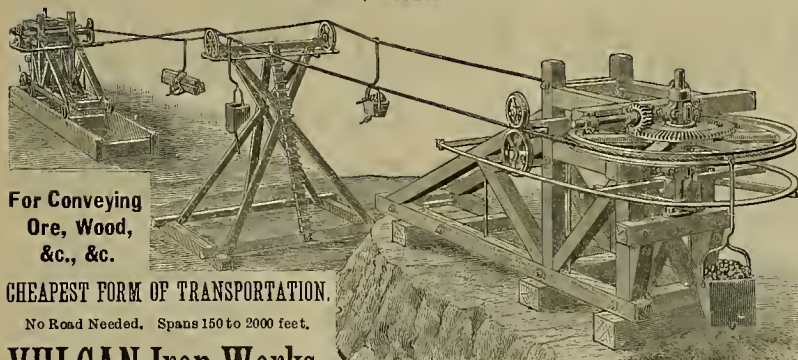


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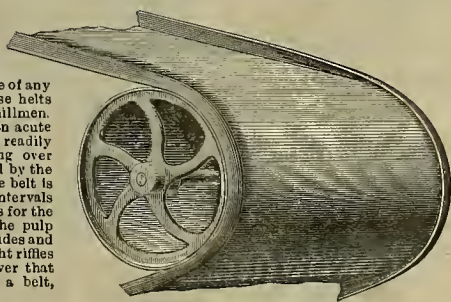
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We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen.

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H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.



HOSKIN'S PATENT BLOW-PIPE AND ASSAY FURNACES,

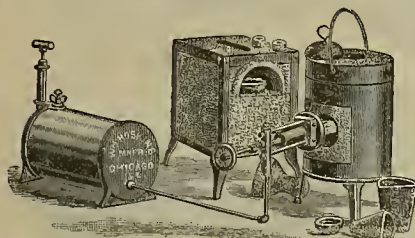
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Portable! Practical! Automatic! Economical!

Will do for every thing that a Coal Furnace or Gas Furnace will, and WITHOUT A BLOWER.

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Made in Lengths Desired from 16 to 30 feet.

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In the manufacture of this Pipe, we use only a high grade of annealed Charcoal Iron of great tensile strength. The weight or thickness of metal used, is graded according to service required, and pressure to which the Pipe will be subjected.

FOR ALL UNDERGROUND PURPOSES, we immerse the Pipe in a bath containing a special mixture of ASPHALTUM, PITCH and PETROLEUM, at a Temperature of 300° Fahrenheit. It thus receives a thorough coating, both inside and outside, rendering it impervious to the alkalies of the earth, rust, etc., and is practically indestructible.



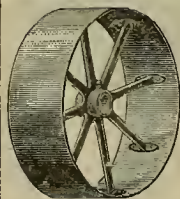
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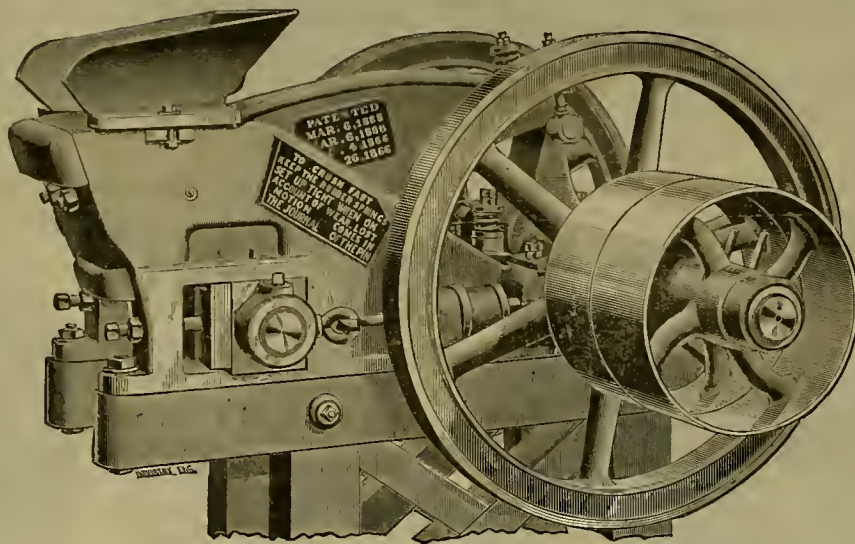
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MILL AND MINE SUPPLIES.

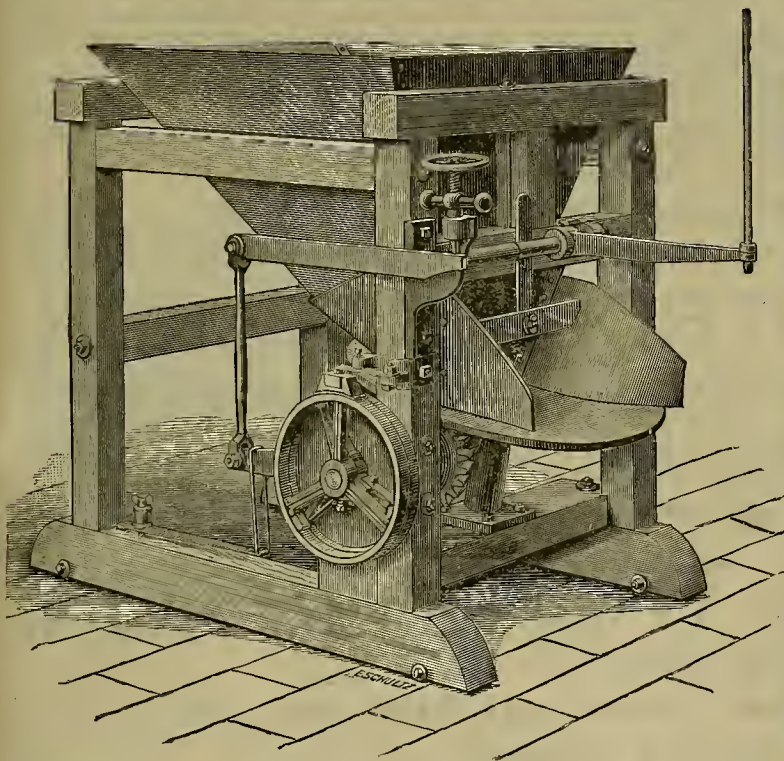
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“HENDY” IMPROVED “CHALLENGE” ORE FEEDER.

THE BEST FORM OF FEEDER EVER DEvised,

And pronounced by reputable mining men to be far superior to any other, as the fact that over 3000 have been placed in successful operation fully demonstrates.

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And will furnish descriptive Catalogues and quote prices upon application.

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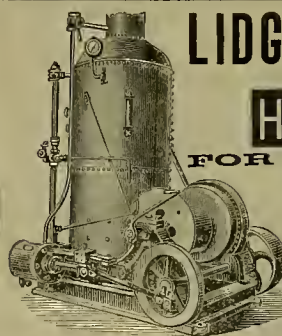
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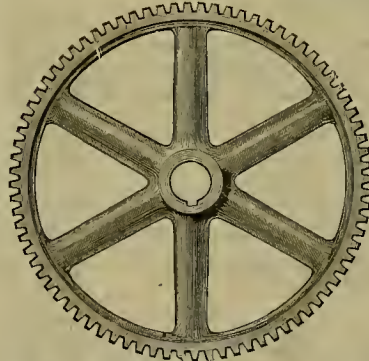
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And Experimental Machinery of All Kinds.

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DRAWINGS, PLANS and SPECIFICATIONS made for
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(Successor to Heins & William),

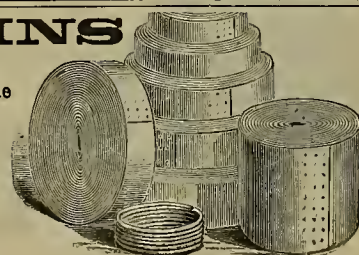
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FRUE ORE CONCENTRATOR

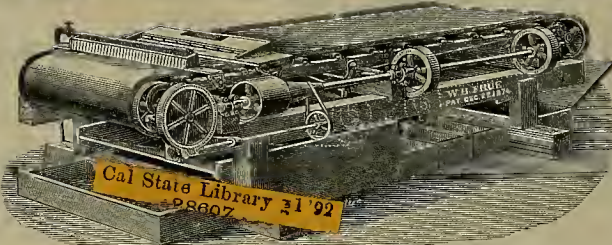
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880

September 18, 1883; July 24, 1888;

and March 31, 1891.

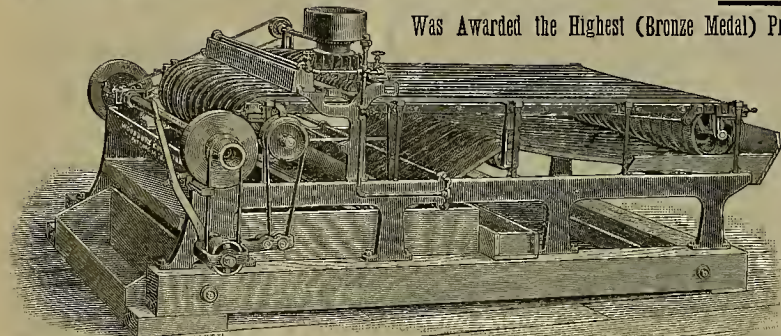
Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS.

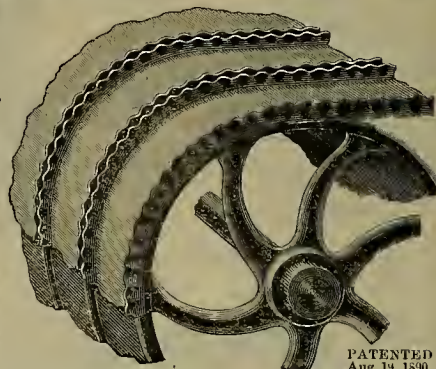
Was Awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891.



More than Double the Capacity
With One-Half Less Power and Occupying Less than
One-Half the Space of any other Concentrator.

Built of Best Steel and Wrought Iron.
STRONG AND DURABLE.
Price.....\$575 f. o. b.
See for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. This excess in length of material effectually prevents the edges from cracking, plain edge belts have to stretch about one inch to the foot as they pass around the drums. This continuous stretch cracks the edges. The improved belt obviates that difficulty.



PATENTED
Aug. 19, 1890.

GEO. E. WOODBURY, Man'fr. 213 to 219 First St., San Francisco.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 2000 IN ACTUAL USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

ELECTRIC TRANSMISSION.

The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

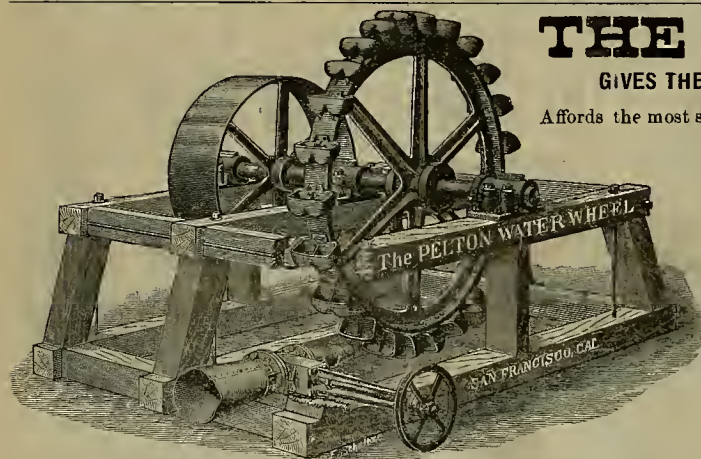
All applications should state amount and head of water, power required and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

THE PELTON WATER WHEEL CO.

121-123 MAIN STREET, SAN FRANCISCO, CAL., U. S. A.

143 LIBERTY STREET, NEW YORK, U. S. A.

PELTON WATER MOTORS, Varying from the fraction of 1 up to 40 and 50-horse power, unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. SEND FOR MOTOR CIRCULAR. Address as above.



THE GATES ORE AND ROCK BREAKER.

UNLIMITED IN CAPACITY. UNEQUALED IN EFFICIENCY. UPWARD OF 3,000 NOW IN USE. Will do more than twice the work of any other with the same cost in wear. Gives a fineness of product that increases the capacity of any mill from 25 to 40 per cent without any additional expense. THE BEST AND ONLY CRUSHER ADAPTED TO MACADAM ROAD WORK. Send for Circular.

It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

THE PELTON WATER WHEEL CO. 121-123 Main Street San Francisco, General Western Agents.

LONG DISTANCE ELECTRIC POWER TRANSMISSION.

WATER POWER

Made Available over Circuit Many Miles Long for Running TRAMWAYS, HOISTS, DRILLS, STAMPS, PUMPS, LIGHT, &c.

FOR PARTICULARS AND ESTIMATES, CALL ON OR ADDRESS

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15 FIRST STREET, SAN FRANCISCO.

F. A. HUNTINGTON.

— MANUFACTURER OF —

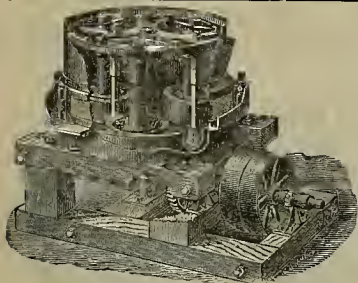
CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description.

Steam Engines and Shingle Machines.

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Centrifugal Roller Quartz Mill.

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DEWEY & CO., PUBLISHERS.

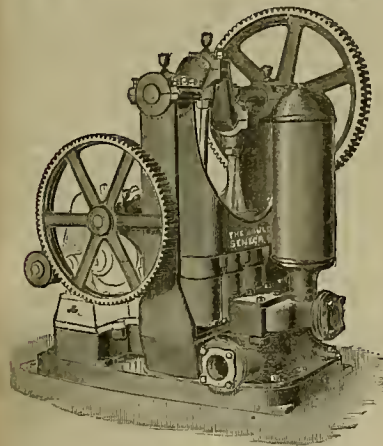
SAN FRANCISCO, SATURDAY, NOVEMBER 14, 1891.

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SINGLE COPIES, 10 CENTS.

Electric Mine Locomotives.

In last week's PRESS, illustrations were given from Mr. Spaulding's paper on "Electric Power Transmission in Mining Operations," showing a locomotive for underground work. Another out from the same source is given on this page, showing a 40-horse power electric mining locomotive in use in a Pennsylvania colliery. At that place the power plant consists of a standard Armington & Sims engine of 60-horse power, and a 50-horse power Thomson-Houston generator wound for a current of 220 volts potential and the necessary appliances for its operation. The engine and dynamo-room, at the top of the shaft, are in charge of the engineer and assistant who operate the other mining machinery.

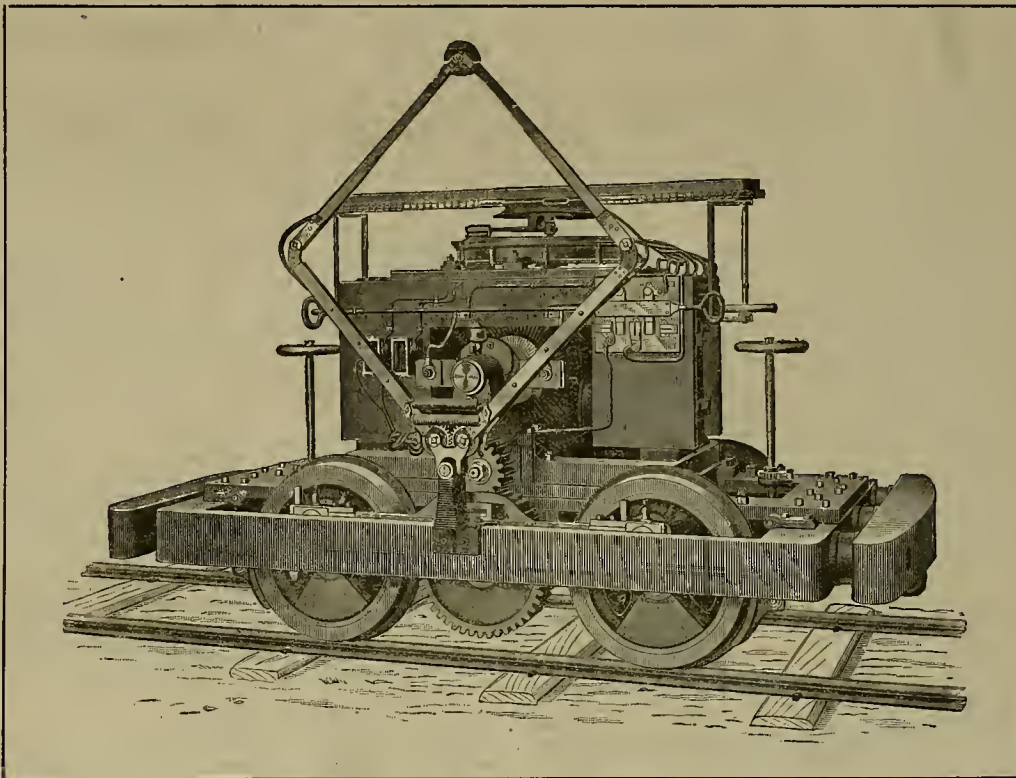
From the dynamo to the foot of the shaft the current is conducted by No. 0 Clark wires, enclosed in gas pipes to protect them from damage. From the bottom of the shaft the wires are carried overhead, about 12 inches outside of the low rail of each track, and are supported from an insulator specially designed for this class of work, the construction of which can be readily seen from the accompanying illustration. Whenever turnouts occur, frogs (shown in the cut) are used, the conductors being sold-



GOULD ELECTRIC PUMP.

ered to show them in the same manner as when used for street railway work.

The locomotive was partly described in last week's PRESS. Pinions on the armature shaft mesh with intermediate gears, connection between these and slotted connecting-rods being made through the ordinary crank-pin and box.



FORTY-HORSE POWER ELECTRIC MINING LOCOMOTIVE.

This arrangement allows for variation in position between the wheels and body of the locomotive which carries the motor; and, as the crank-pins on opposite sides are placed at an angle of 90 degrees, there are no dead points. The brake mechanism, rheostat and reversing-switch may be operated from either end by the hand-wheels shown in the cut. The operator has everything under complete control, and can start or stop the car and reverse its direction without moving from one position.

During a period of 11½ days, the average number of cars delivered at the shaft bottom by the locomotive was 559.5, against 526.95 per day delivered by mule-haulage, much time being consumed by waiting at the shaft bottom for empty cars. Thus far the locomotive has shown it will increase the output to 700 cars per day. To deliver 700 cars per day of ten hours, the time of running the locomotive is 5 hours 30 minutes, leaving 4 hours 30 minutes

for contingencies. The total distance run is 21.28 miles, and the locomotive is reversed 232 times.

The first electric pump of considerable size, which, to the writer's knowledge, has been designed, is shown in the engraving. It is made by the Gould Manufacturing Co. of Seneca Falls, N. Y., and is efficient. The pump, as shown, consists of three vertical cylinders, within which are three single-acting plungers, their cranks being hung from the main shaft at 120° angles, in order to produce the most even application of power. In addition to this class of pumps for general hydraulic work, the Van Depoele type of reciprocating engine is being adapted to a sinking pump, which has, as yet, not been sufficiently tested to warrant further mention here.

ELECTRIC LIGHT wires in this city cannot be longer maintained on housetops.

TELLURIUM.—A dispatch from Redding, Shasta county, says: A rich ore body of tellurium and gold has been discovered in the mine of the Eureka Tellurium Co., at Middle Creek. The vein is about eight feet wide and it was struck at the end of a 40-foot drift from a 700-foot tunnel in the hillside and about 200 feet below the surface. It is supposed to be the same vein which was struck a few years ago when an incline tunnel 125 feet long was sunk in the hillside, but which could not be worked because of its rapidly filling with water. The company has put in the most complete machinery plant to be found in the county.

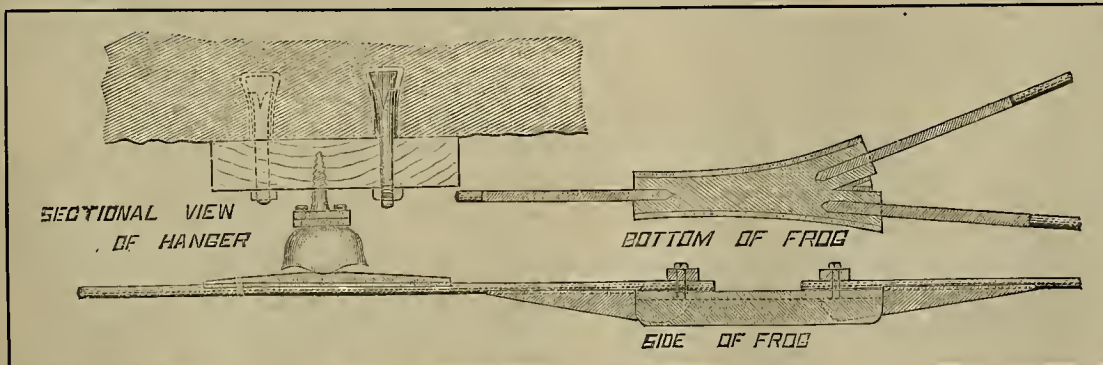
The miners in the North of France are about to strike. They want the sick and pension funds managed by the Government instead of by the mining companies. They also demand a modification of the system of compulsory cessation of pit work, which was arranged in order to reduce the output.

The San Francisco & San Mateo Railway Company has notified the Supervisors that it has spent \$50,000 in the construction of the railroad, as required by the franchise granted one year since.

By a gas explosion in the Susquehanna coal mine, Nanticoke, Pa., on Sunday, nine men were killed and several others injured.

The Reduction and Extraction Works at Kingston, N. M., will increase their present capacity to 100 tons per day.

It is reported that operations will soon be commenced in the Cherokee mine by the drifting process.



HANGER AND FROGS FOR ELECTRIC MINE LOCOMOTIVE.

What California Mining Needs.

Opportunities for Investment in This State.

The Oroville (Butte Co.) *Register*, of Nov. 5, has an interview with Col. Frank McLaughlin, which is as follows:

When asked his opinion concerning the mining outlook in Butte at the present time, he replied: "I think the outlook is very encouraging. The local press has been hammering away on this subject for some time past and the reviews thereon by the newspapers at large have directed much attention to the mining industry in this section. In fact, I do not know of any county in the State that is receiving more attention than Butte. The extensive river mining works, now under way near Oroville, are also doing their share in calling widespread attention to the unlimited mineral resources of our country, resources that embrace all classes of gold mining. In Plumas and Sierra counties the success of Happy Hollow and Scotch Company at Gibsonville, and many other paying properties, have done a great deal of good for mining investment in those counties, of which I believe Plumas to be the richest in mineral deposits of any in this State."

Drift Mining.

"I think that drift mining will receive a great deal of attention in the future and I believe that money invested in that class of mining will be amply remunerated. In my opinion, the true wealth of the Sierras lies in the old Pliocene rivers, those auriferous storehouses that enriched our present streams, and the rich bars and gulches that so amply rewarded the mining Argonauts. There is a large amount of this class of mining being carried on in this county, particularly at Brown's Ravine in the Gravel Range, and throughout the Dogtown ridge. The present strike on the old Mineral Slide mine is bound to attract capital to that section, which, with the assured reopening of the celebrated Pershaker mine, is a forerunner of the future prosperity and business of Dogtown and the other historical mining camps of that gold-producing region. The river beds, now buried beneath the lava, that in past ages flowed into the canyons of those ancient rivers and there solidified, will be the future treasury of the miners of this county, and one from which they will draw millions. The gold of the big gravel flats, which surround us here, formerly the site of the hydraulic mines of the past prosperous mining era, was undoubtedly derived from those old channels, though the gold contained in the former gravel deposits, having been transmitted from a great distance, and being, therefore, more greatly "washed," is much finer than that now found in the old river channels themselves.

Old River Systems.

"The geology of the Sierras is largely a sealed book to the miner, it is so little understood. The best producing gold mines in California to-day, are drift mines, yet no certain knowledge exists as to the location or trend of the old rivers in which these drift mines are carried on. The striking of them is largely a matter of luck, even with the most experienced drift miners, who, with the assistance of their own practical knowledge, could study to great advantage the articles and papers on the ancient river beds, particularly Whitney's "Auriferous Gravels," and others which have been written by those eminent authorities, W. A. Goodyear, John Hays Hammond, Prof. Le Conte, Prof. Hanks, Ross E. Browne, A. J. Bowie and R. L. Dunn.

As an instance of the advantage of a scientific study of the ancient river systems, we have the case of Mr. Goodyear who correctly located the course of the "Mountain Gate" channel long before the discovery of the "Hidden Treasure," both bonanzas of Placer county; and more extraordinary still, he prognosticated the bend in the channel of the Paragon mine long before the Mayflower discovery, which when opened up, demonstrated that his theory was correct. The English Government greatly assists the miners in Australia and New Zealand by giving them the experience and advice of the most competent experts, by most complete and elaborate geological maps and surveys of the mining regions, exhaustive examination by means of diamond drills, etc., and I believe a proper study of the distribution of the old river systems by our own competent Government authorities and the proper dissemination of such knowledge when acquired would open up vast deposits of gold now unknown to the miner or prospector.

The Great Drawback.

"The greatest drawback that mining has in this State is the lack of encouragement it receives from local capitalists. We badly need capital to assist in developing mining properties. No man can borrow a dollar from the banks or other financial institutions on such security, though money can be borrowed easily on land here of cultivation, or growing wheat, etc., or orange or olive land, even though it be just planted, but not a dollar can be raised on good mining property. The trouble with Californians is that while collectively they all hurrah for mining, individually too many are opposed to it."

"The statesman who can devise a means of State assistance to help the working miner develop our hidden mineral resources will indeed be hailed as a benefactor. There is no more brave or determined band of heroes in the land

than the gold prospectors in our State, or a class more deserving of national or State aid—aid which by helping the individual would at the same time add vastly to the material development of our country.

To Develop Prospects.

Many a bonanza is lying dormant in this State for lack of a few hundred dollars required by its locator to develop it. How many a miner has passed over to the great majority, leaving a location or property practically unopened for want of a little money, and which property has lapsed into the wilderness from which its dead owner lay down his life in privation and lonely sorrow in his brave attempt to wrest it. I tell you no one in a thousand of our people know the gallant fight that is carried on from year's end to year's end, and by the miners and prospectors of this country. Ridicule, doubt, loneliness, want, extremes of heat and cold, and the most fatiguing labor are the lot of many a brave and noble heart that is to-day laying the foundations of wealth for those who will never know, or perhaps care but little if they did know, the story of the struggle that was waged by the prospector. If our Mining Bureau, which, under its present most capable head, Wm. Ireland, Jr., is more in touch with the mining industry of this State than I have yet known that Bureau to be, had the power to send some of its competent mining attaches to investigate a miner's prospect upon his request for such examination, and if in the opinion of such expert there was every indication that a good mine could be developed by the expenditure of a certain sum of money, and the Bureau could then loan such sum to the miner under certain forms and restrictions, I believe the gold output of this State would be more than doubled by the expiration of two years from the inauguration of such State system of assistance. Here is a chance for some Native Son of the Golden West who aspires to political prominence to make his name blessed and honored, a chance to reward the man who made this State, and who are making it what it is to-day, a chance to pay a debt of gratitude, the result of which will open up mines that will restore to the world the gold now lost to it by the unjust and arrogant stoppage of hydraulic mining.

Governor Stanford has promulgated a theory of National assistance for the farmers; who will do the same for the miners? I have known instances where men have spent years, in some cases almost a lifetime, in trying to develop a mine. They would mine for a few months and then be obliged to seek other employment to earn money, then return and spend it for supplies and labor at his mine. Years have been wasted in this way, where with a little capital and machinery the development could have been made in a few months.

Capital Wanted.

"Capital for mining must come largely from the outside. In this State it is mostly held by elderly men, who will only loan money on the most gilt edged security, and mines they do not consider of that class, though as a rule their fortunes were acquired either directly or indirectly from mining. Lacking State or national assistance, relief may be obtained by proper representations of our great mineral resources, which would tend to bring into this State prospectors who cannot carry on their work during the severe winters of Montana, Nevada, Utah, Idaho or Colorado, many of whom would probably have Eastern capital at their back. Such men would have a practically unlimited field for their skill and knowledge, as there are hundreds of square miles in Butte, Plumas and Sierra counties which are to-day untraveled and unprospected, beyond the mere superficial prospecting of the early-day miner, who only searched for \$100 rock or \$20 a day diggings, and so passed by or abandoned as worthless and left to the wilderness mines that to-day would be snapped at if they were located and opened up for the inspection of capital.

Mineral Collections.

"Another thing that Butte county ought to do is to have a first-class collection of her minerals, her gold, platinum, silver, iron, copper, mica, coal, yes and her diamonds, for probably a hundred karats of brilliants have been found unsought in the Cherokee mines, got ready for exhibition at the World's Fair. In making known the richness of our mines, we need something stronger than newspaper description or pamphlet publications to place before capitalists.

In Butte County.

"There are any number of bright, of most promising prospects in quartz which, with private capital, or (if it might be) some State allowance to aid in the development, could be made most valuable mines. Take Forbestown, in this county, for instance. This old camp lay almost dead, certainly sleeping, yet it covered mines of untold wealth, and after many years of untold labor and brave devotion, the life-work of its prospectors has finally brought the attention of capital to its mining possibilities, with the result that extensive mines are now being worked there, thousands of dollars being put into circulation, large mills erected, and the owners thereof receiving big reward from properties that two years ago were begging for a little financial help.

"We have to-day near this town, in what is known as the "Lava Beds," one of the richest mining sections in all California. Fabulous sums were taken from the auriferous gravels there, yet no organized effort has ever been

made to reach the deepest gravels, where the greatest deposit of gold must lay. This needs organization with large capital to erect great pumping works to drain the waters and explore the deeper deposits that must certainly be enormously rich. With the intrinsic value they possess, the day will come when capital will seek our mines, but meanwhile we must do all in our power to court investigation and money for development."

The Drilling Contest at Denver.

The Drill Committee of the Mining Congress at Denver has increased the amount of prizes to be awarded for hand drilling to \$2500. It had been originally intended to make the amount \$1000, but the widespread interest aroused in what promises to be the greatest novelty of the congress induced the committee to raise the figures. For the double-handed drill, therefore, the first prize will be \$600, the second \$400, the third \$300, the fourth \$200, and the fifth \$100. The single drill will range: First prize, \$300, second \$200, third \$150, fourth \$100, and fifth \$50.

Following are the rules governing the drilling contest:

The Drilling Committee shall appoint three judges whose duty it shall be to take charge of the drilling contest, mark on the stones where each man or team shall drill, start and stop the men, and measure the depth of the drill hole, and award the prizes, giving to the man or team drilling the deepest and best hole the first prize, to the man or team drilling the next deepest hole the second prize, and so on, and they shall furnish the winners a certificate which shall entitle them to receive the amount won. The decision of these judges shall be final.

Each county in the State of Colorado shall be entitled to send three teams to the contest, of two men each, also three single-hand men. In the event of there being more than that number in any one county desirous of competing, then it must be decided which shall be admitted by home contests, and the teams or men who shall receive a certificate from that member of the Drilling Committee representing their county shall be entitled to enter the contest.

All entries must be made at least five days prior to the date of contest.

In case of inability of any of the contestants to be present on the day of the contest, others from the same county may be substituted at the discretion of the Drilling Committee. The time for drilling shall be limited to 15 minutes.

All drills used by the double-hand teams shall be of seven-eighths steel, and the hammer shall not exceed eight pounds in weight.

Drills used by the single-hand men shall be of five eighths steel, and the hammer shall not exceed four pounds in weight.

Each team or man shall furnish their own drills and hammers.

All work shall be down holes and in granite blocks provided by the committee.

In case of a tie, the winner shall be decided by drilling again as may be decided by the judges.

Any team or man who shall violate any of the rules or refuse to obey any of the instructions of the judges shall forfeit all right to contest or to receive any of the prizes.

The above rules are subject to change by the Drilling Committee.

Parties desirous of offering special prizes are requested to notify the Drilling Committee.

The Coalinga Oil Fields.

The Fresno *Expositor* of Nov. 6, says: Reports from the Coalinga oil fields show that there is no delay in the work and no lack of enterprise on the part of the present lessees of the land on which the oil has already been struck, and on which the well has been sunk.

It will be remembered that the locators of the claims leased the lands controlled by them to Messrs. Lacey & Rowland, two Los Angeles oil dealers, who have, as a part of their lease, agreed to develop the property and to give a certain portion of the oil developed as a royalty.

These gentlemen, while continuing in part the work already commenced, have been industriously preparing for their grand work of development, which is now about to begin. They have on the ground the entire machinery for sinking a well to the depth of 1800 or 2000 feet. The immense derrick is of heavy timber, and its heavy foundation has been some time in constructing. The power for the work of sinking the well will be furnished from an engine and boiler already set up. The fuel used will be the oil from the four-inch well, which has been sunk to a depth of 300 feet and from which a fair supply of oil is now being pumped.

The oil now being taken from the well is of fine quality and runs fully 15 or 16 per cent better than the oil from the wells in Pennsylvania.

The work of sinking the great 14-inch well will take considerable time and a large amount of money, but there is no thought of giving over the undertaking until it is at least that far down, unless, of course, the work is stopped by the excessive flow of oil.

There are plenty of prospectors in the region looking for locations, and at present it looks as though considerable money will be invested in that section soon.

Southern California Oil Fields.

In addition to the many other products of the southern portion of the State, oil is no insignificant part, as the following facts and figures, furnished the Riverside *Press* by a friend interested in the Newhall district, will demonstrate.

The Newhall oil district is situated 30 miles northwest of Los Angeles, on the main line of the Southern Pacific railroad. The main oil belt extends for about eight miles through the San Fernando mountains in a southeasterly and northwesterly direction, the formation being entirely of sandstone and oil-bearing shales.

Developments were begun here in 1876 by the California Star Oil Company, at a point seven miles west of Newhall station, and developments have been continued ever since the company merged into what is now known as the Pacific Coast Oil Company.

Developments have recently been commenced on the east side of Newhall, in what is known as the Ellemere district. The remarkable depths of the oil-producing sand have not been exceeded anywhere, ranging in thickness 350 to 755 feet. The first wells bored 15 years ago still yield large quantities of oil with no signs of falling.

At Pico canyon there is a strip of land 840 feet wide and 3800 feet long that has yielded more than a million and a half barrels of oil, and still produces without any appearance of giving out.

The oil of this district is a fine illuminating oil about 41° gravity, being little, if any, inferior to the Pennsylvania product. It is shipped to San Francisco in tank cars, and refined at Alameda Point, eight miles from San Francisco. About a train per day is shipped at the present time, which will soon be largely increased, as a number of new wells are being drilled.

There is one well among this group that has yielded more than \$300,000 worth of oil. Similar indications of rich oil-bearing sand have been traced all through the eight miles of this oil belt by geologists and expert oil miners.

There are a large number of oil indications in Southern California, but few that possess the remarkable indications that are to be found in the Newhall district. At present the developments being made in the Ellemere district, two and a half miles east of Newhall, indicate that the oil sand can be reached at a depth ranging from 280 to 450 feet, and that oil can be produced in paying quantities at that depth.

The average cost of boring an oil well at present ranges from \$4000 to \$6000. As the demand for oil for fuel purposes in Southern California is practically unlimited, it warrants the conclusion that it is a good investment to develop these lands.

There are now 50 wells, with a daily aggregate production of 900 barrels, which amount is steadily increasing. The high percentage of illuminating oil obtained from this crude petroleum warrants the belief that an illuminating oil of a superior quality can be obtained from this oil sand at almost any point within the limits of the oil belt.

The present income of the Pacific Coast Oil Company from the Newhall wells is \$2000 per day, or \$60,000 per month. The running expenses are \$10,000 per month, leaving quite a handsome sum as profit, to be divided up among the stockholders. It beats orange growing a trifle.

THE BLUE LEAD.—W. W. Will, who is a son of Mrs. Bishop, of Bangor, on whose place the blue lead was discovered some months ago, returned from there last night, says Friday's Oroville *Mercury*. He has built an arrastra on his mother's mine, and they are now grinding that peculiar formation. Sufficient prospecting has been done to guarantee good returns. For instance, 70 buckets of the dirt that was hauled from the shaft was run through the usual sluice-box. Then two of those hoses, each 16 feet long, were cleaned up, and the result was \$16 35, and the dirt was not crushed before it was washed. The lead is hard and slaty in appearance and must be crushed. Simply running it through the sluice will not get the gold. The gravel runs all along from 10 to 50 cents a pan. Mr. Will says four companies are engaged in sinking shafts. One is composed of Marysville men, Messrs. Streeter and Bonlaw of Biggs, Dr. Allan and the Bishop mine. Excitement is running pretty high and there is no prognosticating what will be developed there. That the gravel, if such it may be called, is very rich is established beyond question. There is a sample left at the *Mercury* office by Mr. Will that shows several fine speckles on the surface.

ALASKA'S MINERAL WEALTH.—J. C. Green, who is largely interested in mining property in Alaska, has just returned from the north and is now in San Francisco. He says: "The mining outlook in Alaska is improving year after year. The whole country is simply teeming with rich mineral fields, and I am convinced that the day will come when Alaska as a producer of gold and silver will surpass the world. Ranges are being located rapidly, and I know one man who has from 25 to 30 rich claims, which, when developed, will make him, in my opinion, one of the richest men in the world. The industry is yet in its infancy, and capital will be required to develop the lodes, but when the boom once begins it will knock the '49 days of California cold."

An Unjust Decision.

Mines or Railroad Grants.

The following is from the *Battle* (Mont.) *Ey-Stander*:

The writer has examined most of the decisions of the courts hearing on the question as to what are mineral lands in the several Acts granting lands to railroad companies, but reserving therefrom such lands as are mineral. In them there is evidently a settled purpose to give to railroad companies to which Congress granted public lands all lands within their grants except those known to be mineral at the time of the definite location of the lines of the several roads. There is a possibility that where lands which cannot be identified because they are not surveyed and on which mineral has been found before survey, may escape this legal drag-net that has been set to catch nearly all the mineral lands on odd sections within the limits of the grant to the Northern Pacific and other roads. The question must be settled in the Supreme Court of the United States, which has already intimated, in a case which went up from this city, that its decision would be in favor of the land-grant railroad companies. There is only one decision unfavorable to the railroad companies, and that is Judge Knowles' opinion in the *Barden* case, where Sawyer and Knowles disagreed. As Sawyer was a circuit judge, his opinion in favor of the road prevailed, but it has been taken to the Supreme Court by and will remain under the control of Major Martin Maginnis, Mineral Land Commissioner of this State.

Within the last week Judge Caldwell, who, we understand, is United States District Judge for North Dakota, at Fargo, in rendering a decision as to the liability of the Northern Pacific Company for taxes, seems to have gone out of his way to reiterate Judge Sawyer's opinion, and even to have gone beyond it, giving the Northern Pacific Company all the mineral lands within the grant and all the mineral within their depths.

That our readers may know how monstrously unjust this opinion is, we recall the facts.

Congress in 1866, in making a grant of the odd sections of land to the Northern Pacific Co., within certain distances each side of its line, excepted the mineral lands. In the same section, out of abundance of caution, it excluded all mineral lands from the grant, and in lieu of such mineral lands so excluded, extended the limits of the grant on each side ten miles farther. At the next session of the same Congress a joint resolution was passed, reserving all mineral lands from grants of lands which had been made to railroad companies at the previous session. These laws make it plain that it was the intention of Congress to reserve from grants of lands to railroad companies all mineral lands—that is, all lands containing minerals. Thus the plain, evident meaning of the laws making grants of lands to railroads was to give them all lands not mineral, classing iron and coal lands as non mineral.

The arguments for and against the claim of the railroad to the mineral lands within their grants are too long to be more than referred to here. To state them fully would take several numbers of the *Ey-Stander* if the space was wholly devoted to that purpose. We shall give them as briefly as possible.

On behalf of the railroads, it is claimed that grants to the companies were *in present*—that is, conveying present title, and that as soon as the line was located and the land was surveyed, the title to the lands granted passed from the United States to the company, and that if the United States did not know there was any of the land mineral, it could not afterward set up the fact that mineral was found upon it, and take it from the company to whom the title had passed; that Congress could not have meant that these lands might be trespassed upon 10, or 100, or 1000 years afterward, and if mineral was found thereon deprive the company or its grantees of title thereto.

The argument on behalf of the Government is that the law granted only lands not mineral, that as all mineral lands were reserved, they could not pass with the grant, and therefore they belonged to the United States. The law puts the burden of proof on the railroad companies, and as they cannot take any mineral land, they must show there is no mineral land on the odd sections before such title passes. The title passes to all lands not mineral, but unless they show a given piece of land is not mineral, they cannot take it.

As to the mineral character of the land, it is claimed by the Government that if any mineral is found upon any odd section, that is proof that it was mineral at the time the grant attached, and that said land was exempt from any effect of the grant, and cannot pass to the company.

The claim of the Government is further strengthened by the rules constraining grants, which is settled by hundreds of decisions, that they shall be strictly construed against the grantees, and that such a construction of the law will not permit the railroad companies to acquire title to any mineral lands.

Then the fact that Congress set apart so large a body of lands which could be taken in lieu of the lands found to be mineral, is urged as a convincing proof that Congress did not intend that any mineral lands should pass to the railroads under the grant.

It also further shows that previous to the passage of the act granting lands to the North-

ern Pacific road, the mountainous lands were known to contain mineral. Thaddeus Stevens said the line would probably pass through the richest mineral region of the country. The congressmen did not know just where the mineral was, but they were assured it would be found all over the mountainous region through which the line would pass. Believing this, it could not have been possible that Congress in reserving mineral lands from this grant, and providing that other lands might be taken in lieu of mineral lands, whose title could not pass to the company, could have meant that any mineral lands should be conveyed because the mineral in it had not been found.

For our part, we do not believe that the grant conveyed present title; therefore it was not "in present," although the supreme court has so said. If this point was argued it would be seen that such a decision is at variance with previous decisions announced by this court. The fact that it even made such a decision shows the influence which railroads have in that court. And if the power of these roads has reached this tribunal, so as to influence its decisions, it shows the great necessity of putting the law making, executive and judicial departments of both State and federal governments in the control of the people. Workingmen must rule this country if they are not to be robbed and enslaved forever by unjust and wicked laws and unwarranted decisions of courts.

Use of Water for Milling.

The R. C. quartz mine and mill is located nearly half of one mile to the east of Brownville, in Yuba county, and is owned by Reuben Clark, a wealthy Colusa county farmer. The mine has been thoroughly prospected, the work extending over a period of several years under the supervision of J. C. Campbell, a practical miner and mineralogist, who during the past summer erected a first-class eight-stamp quartz mill. A large amount of quartz had been raised to the surface and was prepared for crushing as soon as the mill was finished to receive it, and the superintendent expected to have extracted a considerable amount of gold prior to this time.

The power used to run the machinery of the mill is a Pelton water-wheel, which is set about 300 feet below the mill and connected by a wire rope extending from the wheel to the mill. To run the wheel, water was taken from Dry creek, which, after being used, was again turned into the creek with little if any loss. When Supt. Campbell commenced using the water, an injunction was served on him restraining the owner of the mine from taking and using the water, which was claimed by John Knmle and John Barges, who in connection with the South Feather Water and Mining Co. had located and claimed it under the laws of the State to be sold for irrigation and other purposes.

When the case was brought before Judge Davis some time ago, the Court required plaintiffs to give a bond in the sum of \$3000 before he would continue the injunction in force, as it was evident that damage might result from compelling the mill of defendant to remain idle. During the past week or ten days, Knmle and Barges retired from the case, which left the South Feather Water and Mining Co. alone in the contest to perpetually enjoin Clark from using the water.

During Saturday and yesterday the case was up before Judge Davis on a motion by Clark to have the injunction dissolved, which if granted will allow the water to be taken to run the mill without being obliged to pay the water company for it. The case was submitted last evening after a long and tedious argument by counsel, when it was taken under consideration by Judge Davis, who announced that he would render a decision to-day at 2 o'clock p. m. As this is written prior to the time fixed for determining the result, the *Democrat* cannot definitely say what the ruling of the Court will be, but on the principle that has heretofore governed such cases, and the rule laid down relative to the use of public waters and timber for mining purposes, the injunction should be dissolved. If the water was taken and used to the exclusion of others, and damage occur from such exclusive use, the case would occupy a different position; but in this instance no damage is done except to the claimants of the water in the amount of compensation to be derived for its use. At 2 o'clock Judge Davis read his decision, which was quite lengthy, sustaining the motion to dissolve the injunction. —*Marysville Democrat*.

TEXAS ALIEN LAND ACT.—Judge Goodrich, of the District Court of McLennan county, Texas, has rendered a decision in the case of the State of Texas vs. Mallinson, in which he has held the alien land law unconstitutional, on the ground of defects in the caption, which, among other things, refers to individuals without mentioning corporations, while the law inhibits corporations, any stockholders or shareholders of which are foreigners, from holding land. The judge said that the faultiness of the caption was enough to nullify the Act, but added that he regarded the Act as wholly opposed to the Federal Constitution, as it set at naught existing treaties with foreign nations, and its effect upon property rights existing and charters granted by the State in years past was disastrous in its retroactive effect. The case will be appealed.

Southern California Mines.

The San Diego *Union* of Nov. 5th says: A large number of people, it seems, have gone out to the camp at Dos Cabezas, where Burnett & Higgins claim to have discovered silver ore. No further knowledge than this can be obtained until some responsible person arrives from the camp.

James H. Crossman has succeeded in organizing a company to operate mines in the Gavilan district, which is a portion of the San Jacinto estate. A regular network of quartz and feldspar veins traverse the crystalline rocks of that section, and from one of these, the Gavilan, many thousands of dollars have been taken. Prospects have also been found in other veins, and Mr. Crossman and his company may make large fortunes from the mines. The property is leased from the San Jacinto estate (limited), the London corporation operating the tin mines.

A strike of rich gold rock has been made at Menifee, near Perris, by S. E. Walker, in digging a well at his place. The quartz seam was uncovered, it is reported, at a depth of two feet, where it was two inches wide, but containing a large amount of gold. The prospect will be developed.

The Helvetia mill at Julian is crushing quartz rock from the rich bonanza recently opened in that mine.

The boom in Julian has not "let up" a particle, but the encouragement is as great or greater than ever. During the winter the miners calculate to prosecute the development of their claims, and next spring the district promises to be one of the liveliest gold camps on the coast.

The Warlock is as busy as ever. The rich shoot is still in the face, and its known extent is being enlarged every day.

The Cincinnati Bell is also still in bonanza. The *Sentinel* says a project is on foot to run a crosscut tunnel to tap the system of ledges in the hill on which the Kentock S. Cincinnati Bell and several other prominent mines are located.

The Ready Relief, it is understood, is opening another of those great "rolls" of rich rock which have made that mine famous.

Oil Developments.

An oil-boring apparatus, patterned after those in use in Pennsylvania, formed part of the cargo of the steamer Newport, which sailed last week for Shelter Cove. Upon its arrival at that port the machinery will be transported to a point on the east branch of the south fork of the Eel river, in Southern Humboldt county, where petroleum of the finest quality has been found to exist in great quantity.

About the first of the present year a number of prominent Eureka capitalists formed a corporation known as the Humboldt Oil Land Co., with a capital stock of \$1,000,000, which was all subscribed for. Immediate steps were taken to develop the oil region of Southern Humboldt county. Several experts were brought out from Pennsylvania, and they were unanimous in their opinion regarding the superior quality of the petroleum which was found seeping into the creeks and rivers of the district. With the limited apparatus possessed, several oil "flows" were struck which gave promising results. A. W. Gillilan, a Pennsylvania oil expert, was appointed General Supt. of the company's operations. He at once advised getting machinery which had been tested and proved successful in Eastern oil regions.

Although oil has been known to exist in Humboldt county for 26 years, since the first discoveries were made on the Lower Mattole no effort was made to develop it until the organization of the present company was effected.

Mr. Gillilan, who is in this city, states that the company will soon begin the erection of a refinery at Shelter Cove, to which point the oil will be piped from the wells, a distance of 23 miles. It is probable that by next May the company will have so far advanced with the operations as to be able to put its refined product on the market.

LOW GRADE ORE.—A mine to be a good "company mine" should be a large one and worked on a large scale, writes Albert Williams in the *Engineering Magazine*. Thus to be a promising purchase for a proposed corporation, a mine ought to be one which can be worked by a considerable force to insure steadiness of output. A rich but narrow vein where only a limited number of men have room for stopping may be the best for individual ownership, since running expenses are low, and it is not so good for a company as a large deposit of lower grade, capable of being extensively opened and presenting large breasts in the stopes, with a more regular output. The most reliable gold mines have been of very low grade, but with large and regular deposits. In California \$15 a ton is considered a very fair basis for a company-mine if the ore is in quantity; but a very much lower tenor has been worked with great profit in the exceptionally large deposits of the Black Hills and Alaska, where \$5 a ton would leave a liberal margin for dividends. In fact most of the famous mines have not been of high grade, the gold ore rarely showing any metal to the eye, so that most mines have a prejudice against what are called "specimen mines." The same holds to a less extent with the silver

and ore mines. On the Comstock, the heart of "the big bonanza," the greatest ore body ever known, averaged only \$80 per ton including the rich streaks, and that was thought to be very high. The great silver mines of Montana have not averaged anything like as much. There have been exceptions, notably in Arizona, Colorado and Utah, where high-grade ores in comparatively small amounts have produced largely; but, speaking generally, the celebrated mines have not been of that class.

Amador's Resources.

We believe that Amador county has more natural inducements to offer parties seeking homes, and capitalists who wish to wisely invest their money, than any other section of the State. And that she does not now rank among the wealthiest is owing to the fact that the real merits have not been known to men of capital and enterprise. It is now an established fact that our gold mines are among the richest and most extensive on the coast, yet but few of them are developed. Hundreds of mines are lying untouched, which are as rich as well located for profitable workings as the Key-stone, Kennedy, Zille, and other well-known mines which are noted for their output of gold bullion. Many of these undeveloped mines have been sufficiently prospected to show beyond a doubt that they are safe properties for capital to invest in. But for some reason they remain in hands that either have not the means to work them on an extensive scale, or have not the pluck and enterprise to do so.

The county also has an almost inexhaustible supply of some of the best building stone known to mechanism, including the red sandstone, lava, cement stone, and marble equal to any in the world. And strange to say, these deposits of wealth are almost totally unknown to capitalists even of our own State. We also have deposits of coal and lime that in other sections would be regarded as pockets of wealth to those who own them. But here they lie unappreciated, awaiting the day when more enterprising men will step in and make fortunes where poverty prevails for want of exertion and business push. We also have soil and climate for the raising of grapes, fruits and vegetables that can be surpassed by but few spots on the face of the earth. Then why is it that Amador county is comparatively unknown and undeveloped? We answer simply because there is lack of enterprise and business activity on the part of our people. We need a little of the leavening qualities of boomism among our inhabitants. —*Amador Dispatch*.

MINING AT AUSTIN.—Austin *Advocate*: The Austin Mining Co. has put on about 12 additional men. A. Hennessey, Joseph Polkinghorn and P. H. Miles are the shift bosses and C. O. Engstrom and Adam Giersen the machinists. Two six-horse teams are hauling wood from Clifton to the Patriot, and the work of pumping the water from the Patriot is progressing favorably. General Manager Farnsworth and his assistant, James Earles, with the book-keeper, Mr. Cox, are constantly busy putting the affairs of the company in running order. We understand that James Earles will remain in Austin as foreman for Mr. Farnsworth, and also Mr. Cox as book-keeper, and from the reputation of these gentlemen we have great hopes of much substantial prospecting and developing being done that must, of necessity, largely benefit our town and county. Our people have grown poor during the years of inactivity of the Manhattan Co., and now hail the Austin Mining Co., and will aid and encourage it in every legitimate way to success. Its interests are our interests; its success or failures must be our success or failures. We therefore hope that in due course of time the Austin mines may be made to produce bullion as in the days gone by, and that the owners will be rewarded for their investments, and the homes of our citizens re-established and our people be made to feel that there is a chance to live and succeed in the town to which so many have become so devotedly attached.

A GOLD EXCITEMENT.—*Central Nevada*: Near the old Unionville road, between Pleasant Valley and Unionville, at the head of Chinabur canyon, six miles west of Joe Miller's ranch and 65 miles southwest of Battle Mountain by way of Jerney, is the location of a local gold excitement. Three months ago the ledges were discovered by a man named Kennedy, a prospector. For a month he worked quietly along, at odd times making trips to Winnemucca to test his samples. The ranchers near by learned of his find, since when they have all turned out with pick and shovel to dig holes and make locations. The mines are so far removed from the railroad that but meager information has been obtained. The quartz taken from a nine-foot vein by Kennedy ranges from \$10 to \$200 in gold, and carries some silver. He has sunk 60 feet on the vein and taken out 40 tons of ore. In addition to the locations made by Kennedy, Mark Wiggins and Ed Stone have a location, ore assaying as high as \$148 in gold; Warren Hillyer, 3 claims; Jake Leick, 1 claim; S. Kell, 7 claims; besides locations by others. William Ford, F. Ingstrom and others from Austin have visited the mines. The ore is free-milling, and an arrastra is being constructed to reduce the ore. Thirty miners are now in the district.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

WHITE MINE.—Amador Ledger, Nov. 7: The crushing of the rock from the White mine, north of Jackson, at the Amador mill did not pan out very encouragingly. Work at the Bright claim near Jackson was brought to a standstill last week. The American Flat gravel claim at Oleta bids fair to prove a good paying property to those who are now undertaking its development. An incline tunnel has been run to tap the gravel bed, which is said to be several hundred feet wide and three to five feet thick. Gravel has been taken out lately which yields all the way from 50 cents to \$7.50 to the pan. They are putting up machinery to haul the gravel up the incline, which is said to be a much more satisfactory way than to hoist out of a perpendicular shaft. The chlorination works at the Clinton Consolidated were started last week, with a gentleman named Olive from Grass Valley—an experienced man in the treatment of sulphurets—in charge. The hoisting works are not yet in running order, on account of delay in getting the necessary timbers. Both mills are running on ore from the Clinton Consolidated. The sinking of the shaft is being pushed as fast as possible, and will proceed much faster when the new hoisting works get to work, which will be in the course of two or three weeks. The New York mill started last Tuesday and is working remarkably well. Mr. Doane, formerly of Plymouth, is in charge. An electric-light plant will be put in at the Zeile in the near future. The compressed air machinery at the Keystone is not working very satisfactory. It will require time to bring it to the required standard.

SUTTER CREEK.—The mines are still gradually improving. At the Hector they are actively engaged in timbering the shaft, having commenced at the top, and are now down about 50 feet. They have been unable so far to see the water, and are uncertain as to the level they will find it, and there is a possibility that the pumping in the Wildman mine may effect it so that they will have no water to contend with until they reach the bottom levels. The Belmont mill is hung up temporarily on account of the pipe giving out. They are going to replace it with a new 11-inch pipe. There is 315 feet to be made, and an application for bids has been sent to Knight & Co. and C. O. Michell, and the work of making it will be commenced in a few days. All necessary preparations are through at the Lincoln for a winter's run, and they expect to make it pay for some time. At the South Eureka everything is still looking encouraging. The ground is full of little stringers of quartz, and a little gold is found. Progress at the Wildman mine will be reported next week.

Butte.

THE PALO ALTO.—Oroville Mercury, Nov. 6: The Palo Alto mine is now running with ten more new stamps, making it a full-fledged 20-stamp mill. From indications, it is one of the great mines of California. E. McGrath stayed with it for years before he could get a mill up, and when that glad event took place he had rock enough on the dump to run a long time. The first year the ten stamps have turned out many handsome bricks of the "needful," and developments showed that there was room for ten more stamps. They were put in during the past few months, and Mercury is glad to report that the rock gets better and is now averaging about \$7 a ton. The rock seems to be inexhaustable and the owners of the mine are jubilant.

OREGON CITY MINES.—Oroville Mercury, Nov. 6: The Standard G. M. Co. is doing a great deal of work in the mines at Oregon City, on the Feather river, just above Oroville. In early days, the quartz ledges there were famous, and many rich hauls were made. But when the rock did not yield more than \$10 a ton, the mines were abandoned. However, many experienced miners stayed with them, and during the past year, several of the old claims have been bonded to the above named company. Several capitalists below and several well-known mining men of Butte comprise the company, and a good deal of work has been done during the past summer. At the old Bloomingdale mine, one of the several bonded, they have a shaft about 120 feet deep, and are now ready to commence pumping out the 70 feet of water that has accumulated. Their pumps are in position, and work will be commenced next week. Thos. Graner, a well-known mining capitalist, who is an owner in the Palo Alto, is superintending for this company, and he is satisfied that the rock will average \$10 a ton. If so, with the improved machinery now used, the mine is a bonanza. The past several months have been, and the coming winter will be, devoted to development work, and next spring a mill will be erected. The size of the mill will, of course, be governed by the amount and quality of the ore. The miners who have prospected there say that old Oregon City has a bright future under the new order of things.

Humboldt.

HORSESHOE BEND.—Blue Lake Advocate, Nov. 7: The Horseshoe Bend Min. Co. has its sawmill in course of construction at Hawkins Bar, Trinity Co. Mining on Willow creek is about the same as usual. There have been so far no very rich strikes either in quartz or placer. Very little can be done in the line of prospecting this fall, owing to the lateness of the season.

DOWN FORTY FEET.—Mrs. Preston and A. W. Anger passed through Blue Lake, Thursday, en route to Arcata. They had just come from Maple creek and had a spring wagon full of coal from the mine there. They made a short stop at the Advocate office, and we were permitted to inspect a fine specimen taken out at a depth of 40 feet. It was compared with some surface coal of the mine and the superiority of the former was evident. They informed us that they are using coal from the mine for fuel all the time and that it burns well. Operations are going steadily forward at the mine.

Inyo.

PINE MOUNTAIN.—Inyo Index, Nov. 4: S. P. Roberts of Big Pine was in town last week. Mr. Roberts speaks very encouragingly of the mining prospects at Pine Mountain, and predicts that the ledges there will prove rich and permanent. The new mill will soon be producing bullion.

Mono.

THE BODRE CON.—Bodie Miner, Nov. 7: During the past week, east crosscut No. 1, 1700-foot level, was extended 17 feet. East crosscut No. 2, from main north drift, 700-foot level, was extended 13 feet. North drift from top of upraise from south drift No. 2, 700-foot level, was extended 14 feet. South drift 60 feet, the 500-foot level was extended 10 feet. Upraise from south drift, 200-foot level, was extended 13 feet.

THE MONO.—During the past week south drift No. 2, 700-foot level, was extended 13 feet. East crosscut from above south drift was extended 10 feet. There were employed 3 miners and jointly with Bodie, 1 engineer, 1 carpenter, 1 blacksmith, 1 carman, 1 watchman, 1 foreman, and 1 assayer.

Nevada.

MERRIMAC MINE.—Grass Valley Union, Nov. 10: The new incorporation to work the Merrimac quartz mine has found no difficulty in disposing of shares to raise a working capital for that purpose, as 24,000 shares have been sold here at 50 cents per share, and 16,000 more will be taken by S. F. parties. Preparations for work have been commenced under the direction of Charles Stocks, who is to be superintendent of the mine. This mine has been exploited only to a depth of a few hundred feet, is strong and in a good formation. It has long been held in favorable estimate by practical miners.

Plumas.

THE WILDERNESS CO.—Plumas National, Nov. 7: It is with pleasure that we note the formation of another mining company incorporated for the purpose of developing the vast mineral resources of our county. The above-named company is composed of Oakland capitalists—Capt. J. W. Smith, Pres.; C. K. King, Sec'y; Superior Court Judge E. M. Gibson, E. W. Woodward and A. J. McGovern as Directors. The property is located near the Shendoah mine, and several specimens lately assayed by E. W. Harlow gave a result of \$86 per ton of ore. The mines embrace the Seven Pines and Wilderness claims acquired under the mining act of Congress, May 10, 1872, comprises 3000 feet in length and 600 feet in width, situated on both sides of French ravine, in Rich Bar mining district, at an altitude of 2971 feet, being one mile distant from the celebrated Rich Bar, on the east branch of the north fork of Feather river, from which bar, in early days, \$25,000,000 in coarse gold was taken, which gold came from the rich quartz ledges of French ravine. The Seven Pines and Wilderness claims are within 1500 feet of those wonderfully rich mines of the Shendoah Co. and comprise two distinct veins or lodes, each of gold-bearing quartz traceable the entire length. Work already done on the veins shows a face of five feet in width, and is considered by some old miners residing in that district to be the mother lode and the same veins on which the celebrated McGowan mine is situated. The locations were made by Mr. C. K. King of Oakland and Mr. C. H. Mather of Plumas county, and surface explorations have developed ore of a very rich character of free gold quartz. Experienced miners, among whom are Messrs. Bone, Johnson and Jackson of Plumas county, advance the opinion that this property will develop into one of the best paying mines of the State.

San Bernardino.

THE GYPSUM MINE.—South Riverside Bee, Nov. 7: We had the pleasure, in company with J. M. Kelly, of visiting the gypsum mine down in the Santa Ana canyon on Tuesday afternoon. The mine is the property of the Ventura Crystal Plaster Co., and is located in a side canyon about eight or nine miles from Rincon. A good road has been made to the mine and we found about 20 men employed on the work—about 15 in opening up the mine and several others performing other work about the place. A large quantity of gypsum was piled up ready to ship and more was being rapidly quarried out and broken up into convenient sized pieces to handle. A switch is being put in by the Santa Fe Railroad Co. across the Santa Ana river, and the ore will be hauled in wagons to the railroad and taken to San Diego and shipped by boat to San Francisco, there to be made into plaster of Paris. There is a rumor that the Santa Fe Co. will build a switch from their main line across the river and up the canyon to a place near the mine. The gypsum is very pure, and will undoubtedly make a fine article of plaster of Paris. When taken from the mine, it looks like loaf sugar and is hard and brittle like glass.

San Diego.

JULIAN BRIEFS.—Sentinel Nov. 5: Charley Barnett has struck some particularly fine rock in the Hidden Treasure, specimens from that mine exhibited recently surpassing anything in the cabinets around town. Ten tons of that kind of rock would give a man a clear ticket through life. The Sentinel is in hopes that Charley will find plenty of it. The ore now coming from the Cincinnati Belle is very pretty to look at, and the result of the crush is highly pleasing to Superintendent Lane. Twenty-one men are employed by the company at this mine and the Gold King. The Helvetia is working 18 men, and the mill has been busy on rich ore, but is now closed down waiting the arrival of concentrators. There is the same big pay ledge in the face of the drift as has been repeatedly described in these columns, and enough ore is in sight to furnish the men a year's work. L. N. Bailey and son have resumed labor upon the Kentuck S. Smith and Plant are in nearly 100 feet on their new tunnel near the Washington, and will soon cut the ledge they have been driving for. W. O. Havermale has taken a bond upon the Grand Central. Now is the time to work out assessments and dirt is flying from several quarters. There is a possibility that the assessment work on some of the mines now lying idle will uncover good ledges. A few more paying mines would make business hum this winter.

TIN IN THE DESERT.—San Diegoan, Nov. 5: Warner Wheatley returned to-day from his tin mines in the desert. He brought in with him in a buggy about 400 pounds of ore, and says a wagon is following with about 2000 pounds more. An assay is to-day being made of the 400 pounds already ready, and samples of the wagon-load will be sent to San Francisco for reduction. The mines are located 24 miles northeast of Campo in the Laguna mountains. The lead crops out above ground, and is easily traced for a distance of fully two miles. Mr. Wheatley took out nine workmen and left them there to continue prospecting and taking out ore. There is plenty of wood and water on

the ground, and there will be no difficulty in operating the mines. Mr. Wheatley expects some parties here from San Francisco who will take an interest in the development of the mines.

Shasta.

RICHER THAN EVER.—Redding Free Press, Nov. 7: Since the publication last week of the new discovery made in the tunnel of the Eureka tellurium mine, the stockholders have been very much elated by the additional discovery of an abundance of free gold, tellurium and sylvanite ore. In fact, the company has struck it richer than ever. As soon as the strike was made, Secretary Jones looked up the tunnel and telegraphed to Peter Scherer, then in San Francisco, who immediately came home.

THE TELLURIUM MINE.—Democrat, Nov. 1: Much has been written and said about the developments on the Tellurium mine, on Salt creek, that has been prosecuted by Peter Scherer for more than a year past, and the mining fraternity hereabout has watched development on this mine with much interest. In all the vast mining region in this county, it is the only mine of its character yet discovered and being developed. The discovery of the tellurium ore zone on Salt creek at once attracted wide attention, and the mine since named the Tellurium became famous far and near for the chunks of gold and rich sylvanite and gold telluride ore it yielded. But, as is the history of many another good mine, a "horse" came in in slogging the incline shaft on the vein, and many predicted that the mine had, to use a common miner's phrase, "petered." Yesterday we went out to the mine and saw the fruits of Mr. Scherer's pluck, energy and faith. At a point about 650 feet from the mouth of the tunnel, a strong seven or eight foot vein was cut in two. The strike of the vein is east and west, with a dip of 70 to 80 degrees to the south. This ore is the counterpart of that followed down the shaft, carries a large per cent of pyrites and telluride sulphurets assaying an average of about \$68 a ton. Not satisfied with this, Scherer drove the tunnel ahead some 80 feet, and cut two parallel veins with about the same dip, ore from which assays from \$27 to \$60 a ton. He is now drifting west on what we would designate the main vein, and yesterday was taking out rich ore.

Sonoma.

QUICKSILVER.—Healdsburg Enterprise: Mr. Holmes of Knights Valley is engaged in hauling lumber to his place. The lumber he is using in buildings which he is erecting at the Ida Clayton quicksilver mine on his place. Mr. Holmes believes he has a paying vein of ore, and we hope he has.

Sierra.

CLEANUP.—Mt. Messenger, Nov. 7: B. M. Excelsior for last week was 140 ounces of gold (largest since recent discovery of extension of channel) from 900 carloads of gravel.

EXCELSIOR.—Paul Loeffler was over from the north side the first of the week. He and his partners have finished their work at the Excelsior, the rock having got so hard that it was impossible to run the tunnel farther at the price for which it was taken. We have no doubt but that it is a very valuable property. A new contract will be let.

THISTLE.—The Thistle shaft is working about 70 men. A contract for 3000 cords of wood has been let. Three eight-hour shifts are worked in the mine.

Tuolumne.

ATTACHED.—Tuolumne Independent, Nov. 7: The Kanaka quartz mine has been attached for \$485 by Louis Cassaretto, a merchant of Groveland, and Archie Shaw has been placed in charge as keeper. Wm. R. Shaw, the owner, is in Mexico.

THE MARY ELLEN IN ASHES.—Superintendent Cruickshank informs us that the steam quartz mill of the Mary Ellen mine, on the Tuolumne river, near Groveland, was burned to the ground last Thursday night. The mill had been run for day shift only, and at 6 P. M. the fire under the boiler was extinguished. Six men were employed in the mine and mill at the time of the fire. There was no insurance on the property. A water-power mill will probably be built on the old mill site before long. The destroyed mill cost about \$15,000.

NEVADA.

Eureka District.

MEN EMPLOYED.—Eureka Sentinel, Oct. 31: Eureka is dull, but not dead. We do not look for a revival until favorable silver legislation is passed by Congress. It will require silver at par to stimulate production. Capital will take hold when the silver question is settled our way. There is no better mining field on the continent than is presented along the mineral zone from Adams Hill to Secret canyon for the profitable investment of capital. It is the most extensive, as well as the most promising mineral belt in the West to-day. A great many hundreds of claims are located along this belt, many of which carry good prospects at the surface. There are more than 50 mines being worked at the present time in the various subdivisions of Eureka district and Newark and Silverado and Secret canyon and the Diamond range and Spring valley. Outside of the principal mines the forces are small, generally ranging from one or two men to a half dozen. A great deal of the work is being done either by prospectors or tributers. A close estimate, amounting almost to an actual count, places the number of men employed in Eureka and neighboring districts at 250, about one-half of whom are working for day's pay. The rest are for themselves either as prospectors or tributers. Practically, every mine being operated has some sort of showing of ore. It may be only such a quantity as a man can hoist with a windlass or run out of a cut or tunnel with a wheelbarrow in many of the mines, but it demonstrates that we have mineral in more spots and covering a greater area of territory than any other mining district in the whole Western world. We give below an incomplete list of the mines under work with the number of men employed: Diamond, 70; Hamburg, 18; Dunderburg, 7; Eureka Con., 30; Richmond, 20; Williamsburg, 16; Phenix, 8; Jackson, 10; Eureka Tunnel, 1; Pioneer, 2; El Dorado, 2; Connelly, 1; Mortimer, 2; Shindle, 2; Wallace, 2; Silver West, 4; Bullwhacker, 5; Mountain Boy, 3; Geddes, 3; Seventy-six, 2; Diamond Range, 5; Newark, 10; Ruby Hill Tunnel, 3; Silver Connor, 3; Silverado, 9; Page & Corwin, 2; Matamoros, 4; Volk & Piantoni, 2; Lizzie L, 2; Dead Broke, 2; Needie, 2; Dugout, 1; Hugenot, 3; Antelope, 2; Joe Dejour, 5; Eureka Star, 1; Orange, 2; Lord Byron, 7; Reeves & Berry, 2; Silver Lick, 4; Diana,

2; Hagerman, 1; Betti, 1; Oregonian, 2; Margaret, 2; Adelpia, 2; E. H. Rose, 2, and Mount Hope, 2. This is only a partial list, but it will be found substantially correct as far as it goes. There are no doubt several claims that have escaped our notice; but enough have been furnished to show the scope of operations going on in this district. The showing is not what we once had nor what we hope to have again, but it is better than that offered by an utterly stagnant and hopeless camp. Eureka is passing through a severe depression, but it has better prospects of future growth and prosperity than any other town in the State. Our possibilities are without limit when the conditions begin to set in our favor. For the present, however, and possibly for a year to come, the town is too large to be well sustained by the number of producers we have in the field.

Washoe District.

CON. CALIFORNIA AND VIRGINIA.—Enterprise, Nov. 8: There has been extracted from all parts of the mine during the week, 988 1220-2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all the ore worked at that mill during the week (980 tons) was \$24.50 per ton. Bullion shipped to Carson Mint, assay value, about \$30,452.25.

GOULD AND CURRY.—200 level: South drift, which is in old stops, has been extended 17 feet; total, 36 feet; face in quartz showing some value.

BEST AND BELCHER.—1100 level: All work on this level was stopped on October 31st, having been taking out track, pipe, etc., during past week.

OPHIR.—1465 level: Have continued our prospecting work near the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore has been extracted during the week.

MEXICAN.—On the 1465-level, at the end of the end of the crosscut run west from the north lateral drift at a point near the south boundary line of the mine, 132 feet in, we have cut out a small station and begun to sink a one-compartment shaft.

CHOLLAR.—No work has been done in the east crosscut on the south line, 1200-foot level, during the past week. The south drift from the incline station, 1500 level, is out 313 feet; face in porphyry. Extracted and sent to mill in the past week 476 tons of ore; average battery assays, \$16.52.

UNION SHAFT.—West drift from shaft, 900 level, has been advanced during the week 30 feet, making a total distance west of shaft 1326 feet; face in clay and porphyry.

EXCHEQUER.—East crosscut from the north lateral drift 150 feet south of north line, 600 level, is out 85 feet; face in clay and porphyry.

ALPHA.—The south drift from winze, 80 feet north of shaft, 550 level, is out 50 feet. The joint southwest drift from Ward shaft, 1800 level, is out 587 feet; face in porphyry.

WARD COMBINATION SHAFT.—The southwest drift, 1800 level, is out from shaft 587 feet; face in porphyry.

POTOSI.—Southwest drift, 360 feet north line, 1230 level, is out 43 feet; face in porphyry. The east crosscut on south line, 1300 level, is out 284 feet; face in porphyry. The north drift from the winze station, 1400 level, is out 183 feet; face in porphyry and streaks of quartz.

BULLION.—South drift from winze station, Potosi 1500 level, is in Bullion ground 10 feet; face in porphyry. The southwest drift from the 1800 level, Ward shaft, is out 587 feet; face in porphyry.

CON. NEW YORK.—The west crosscut (No. 3), 140 feet north of shaft, 650 level, is out 23 feet; face in soft porphyry. The east crosscut, 700 feet north of shaft, 1100 level, is out 34 feet, the whole distance in quartz, some of which yields fair assays.

SILVER HILL.—Northwest drift, 50 level, is out from shaft 340 feet; face in quartz and porphyry. South crosscut, 160 level, is out from winze 780 feet; face in hard porphyry.

Oaccola District.

GOOD CLAIMS.—Cor. White Pine News, Nov. 7: While our district here is well represented by many good, substantial mining men, at the same time we need capital to invest in our mining interests, in order to show to the whole world what we actually have. Three new discoveries on the summit, two miles east of the town of Oaccola, in metallic lime, horizontal form, only eight feet thick, value in silver \$382. Ore from one of said lodes assayed the above, by McVicar of Salt Lake. The other two have not yet been tested, but have a large grass root showing. Then, one or two miles south of Mr. Hampton's hydraulic works, you will find the American Girl, Mammoth and Yellow Jacket, all in lime contact, cut with vertical feeders supplying the contacts with fortunes of the yellow metal. In the latter Hon. John Butterfield and Mrs. Han a Butterfield, M. D., his very excellent wife, both of Boston, have purchased a half-interest in the Yellow Jacket for \$2000, just about one-fifth of the true value of that mine. A. J. Millick is the one who sold the half interest. Mr. Butterfield two or three years ago bought the Union Jack lode, situated only a few hundred feet above the hydraulic works, and no doubt the Union Jack has largely contributed to Mr. Hampton's placer, for there is over 30 feet in width in this mine that will sample well in gold, and, if developed, would, I believe, prove a bonanza.

ARIZONA.

IMPORTANT MINING DEAL.—Globe Silver Belt, Nov. 4: Prof. James Douglas, Miss Douglas and Mr. Ben Williams of Bisbee arrived in Globe on Sunday last, accompanied by Mr. Philip Oates. Messrs. Douglas and Williams' chief object in visiting Globe at this time was for the purpose of examining the Buffalo copper mine, negotiations for the transfer of which to Messrs. Phelps, Dodge & Co. of New York are pending. The party spent the greater part of Monday and Tuesday in an examination of the Buffalo property, and we are informed, were satisfied with it, so far as they were able to estimate its value. Only two points remain to be determined, namely, a test of the ores (which were thoroughly sampled), and the settlement with the lessees of the property. It is well known that the company which Prof. Douglas represents is desirous of securing a foothold in Globe district, and a favorable report from him will determine the action of the company in the matter. In the event of the negotiations being successful, the deal will likely include a number of adjacent claims belonging to

various parties. It is viewed here as the most important mining transaction in the history of Globe district, and great interest is felt for its consummation. The Rescue Silver Mining Company shipped this week five bars of bullion, making the total to date 57 bars. The mill has been shut down for a cleanup and repairs. The Buffalo smelter was blown in this morning for a final run under present management, the lessees, who are reliably reported to have disposed of their lease to the company represented by Prof. James Douglas. The run will be merely a cleanup of ore and coke now on hand, and will probably continue two weeks or longer.

GOLD.—Prescott *Courier*, Nov. 4: One of the placer miners from English gulch came in with six ounces of beautiful gold taken from that gulch. The gold was very coarse, three of the larger pieces being worth \$20 each. The gold was taken with a rocker. Work is progressing on both ends of the Jerome bucket line, only a gap of about two miles between the two advancing ends at present. Wood is being piled all along the line, to be transported to smelters as soon as the line is finished. The Giroux brothers are having a good deal of prospecting done in the Black Hills country. Yager canyon and vicinity is filled with men working for the United Verde Copper Co. John Webb is reported to have struck a rich body of ore in his Black Hills mine. Messrs. Barlow-Massicks and Swan are putting the Lynx creek hydraulic works in shape to start up as soon as water can be had. The reservoir has been enlarged to double its former capacity. There is a strong probability that work of building the great Lynx Creek dam will be commenced in the spring. The roaster at Copper Basin was started up again yesterday, and all available men put to work.

COLORADO.

FROM GOTHIC.—Cor. *Elk Mt. Pilot*, Nov. 5: A change has been made in the Sylvanite management. The mine will be run all winter to its full capacity. The upper workings will be run mostly by leasers. The Virginia mine will be worked all winter with a force of from six to eight men under a working lease. The leasers have already taken out a car of ore, which netted over \$1,000 to the car in ten days work. Lewis Waite and G. H. Judd have started a tunnel in the iron contact, up Copper creek. They have started a tunnel large enough to run it 2,000 feet with room for a doubled track. H. C. Roberts and P. E. Weston have completed the work on the Man-yunk lode, adjoining the Virginia on the south. The boys have a good showing and have the apex of the vein. Jake Goodwin is down from Queen basin and reports his property looking first-class.

DAKOTA.

GOLDEN REWARD CLEANUP.—Deadwood *Pioneer*, Nov. 2: Col. Carpenter brought the cleanup from the G. R. chlorination works, for the last 15 days of October, to the Deadwood bank yesterday for shipment. The gold brick contains \$16,500, and the lead bar \$1500, making \$18,000, or a total of \$34,500 for the month. The output will be increased 50 per cent as soon as the mammoth roaster is started up, which will be in a few days.

IDAHO.

BISMUTH AND NICKEL.—Wood River *Times*, Nov. 4: George Cranston is again in town with samples of nickel, cobalt and bismuth ore from his claims at the head of the East Fork of Fish creek. He has a great width of vein—fully ten feet in one claim, carrying copper, lead, silver, antimony, nickel, cobalt and bismuth; but the metals are so widely disseminated that he has not as yet been able to make the product pay for working. He recently sent ten pounds of bismuth to St. Louis, for which he received \$2.50 per pound. This was, however, obtained by panning a large quantity, probably all of two tons, which was a very laborious and tedious job, and scarcely paid for his work at the rate of \$1 per day.

DE LAMAR.—*Nugget*, Nov. 2: The DeLamar Co. platted the ground and made measurements preparatory to having the grading done for their mill last week. The mill will be placed in the little gulch just below the present mill, and will be built lengthwise with the gulch with the batteries and pans set in two rows on either side of the center of the building.

ON THE UP-GRADE.—Elmore *Bulletin*, Nov. 7: Rocky Bar is again climbing the grade to prosperity. At the 550-foot level of the great Elmore mine a large body of low-grade ore was encountered several months ago, but it scarcely paid expenses. A winze was then started in the West End drift, the sinking of which was difficult and of slow progress, owing to the vast amount of water encountered. The winze above mentioned was sunk but a few feet before good ore was found, and it was continued down to a depth of 50 feet, the ore body improving in quantity and quality as depth was attained. Evidently the company is satisfied with the developments made in the winze, as the superintendent today advertises for bids to sink the main shaft 200 feet deeper, and also has ordered 40,000 feet of lumber from Casey & Holland's sawmill. Just now the people of this section have good reasons for anticipating booming times by early spring.

MONTANA.

ELECTRICITY FOR PUMPING.—Butte *Inter-Mountain*, Nov. 3: An electrical pump has been ordered from Fraser & Chalmers by the Colorado company, and will be used in forcing the water to supply the new concentrator now being erected. The pump will be placed near the Butte reduction works' dam, and the wires conveying the current will be led from the dynamos at the Colorado concentrator. This will be the first application of electricity to pumping engines in this vicinity, and should it prove as successful as its promoters anticipate its use will be largely adopted by many mills, smelting plants and mines in Butte, which now depend wholly upon steam as a motive power.

REDUCTION WORKS IMPROVEMENTS.—The improvements and additions to the Butte reduction works, which have just been completed, will afford greater facilities for the bandling of the great quantities of ore daily treated at these works. A large elevator has been placed in the smelter to hoist the ore to the Bruckner furnaces, and preparations are being made for the placing in position of another

blast furnace. The concentrator has been extended and two double-decked revolving slime tables have been added to the two already in use. The engine-room has also been enlarged and renovated and four new boilers have been ordered to take the place of those in use at present.

BUTTE NOTES.—*Miner*, Nov. 7: Bullion shipments last week amounted to about \$75,000. The pumps have been set to work on the Morning Star mine on Mercury, east of Montana. For the purpose of making some needed repairs thereto, the Silver Bow mill is now closed down. The shaft of the Pike's Peak mine, south of the city, will be sunk an additional 50 feet, which will make it about 200. Messrs. Grant and Benham are sinking a shaft on the Oncida claim, near the Parrot addition. They have a lease and bond on the property. The scheme for sinking a deep shaft below the city, and driving a long crosscut north to tap the many veins that underlie the city is still underway. The new air compressor at the Alice is about ready for business. The old one, which has rendered good service in the past, will be kept in readiness for use in case of emergency. The Lexington, Alice, Boston and Montana, Butte and Baston, Bluebird, Glengary, Monitron, Colorado, Butte reduction works, Parrot, Anaconda and Bannister companies are all running full blast. A large body of good ore has been encountered in the Manhattan claim, the shaft of which is situated just to the east of Montana street, between Gold and Porphyry. The shaft is now being sunk to the 200-foot level.

AT BUTTE.—*Bystander*, Oct. 31: Monday the first train of ore was shipped from the Anaconda mines over to the smelter, and there have been two trains shipped every day since. The High Ore and the Modoc have begun work, and before the close of the week there will be three or more trains of ore sent to the smelter every day from these mines. It will probably be a week before all of the properties are worked to their full capacity. The Wake-Up-Jim and Buffalo still remain idle. There has been some change in the management of the properties. Mike O'Farrell will be Mr. James Laird's assistant at High Ore, Wake-Up-Jim and Modoc; John Kane will be foreman of the Anaconda, and Mr. Bulger at the St. Lawrence. Already Butte seems like the Butte of yore. There are not so many idle men on the streets, and Main street is crowded with men in the evening as of old. Butte's prosperity depends upon its mines, and there are so many now being worked, and so many leads that have never been explored, that its continued prosperity cannot be doubted. The opening of the Anaconda has awakened the thoughtful men of the city to its opportunities. The town is well laid out on a beautiful slope, it is easily drained, there is water sufficient within reach to furnish a city of half a million of inhabitants, and there is nothing in the way except the smoke to make it desirable for homes as it is now for business.

NEW MEXICO.

LONE MOUNTAIN.—*Southeast Sentinel*, Nov. 3: About four months ago the attention of John Brockman was attracted to the mines of Lone Mountain, and after careful investigation he bonded four claims, the Home Ticket mine, situated about one mile south of the Lone Mountain camp, from Richard Hudson and John Frost; the St. Paul mine, about one-half mile east, owned by Wm. Braun; and the Mayflower and Metal King mines, adjoining claims, on Warren's Flat, from M. W. Neff and Clark Rodgers and W. H. Newcomb. The latter two claims have been purchased. Mr. Brockman has 20 men at work, six of whom are working on the Home Ticket. In this mine the shaft is now 90 feet deep and an 18-inch vein of ore, which returns of shipments show to have a value of \$90 to \$200 a ton, is exposed. The shaft is being rapidly pushed down to the depth of 150 feet, at which drills will be run and the value of the property determined. The ore is shipped to El Paso for treatment.

AT GOLD HILL.—*Western Liberal*, Nov. 6: C. S. Kellum was in from Gold Hill Saturday, and was telling the *Liberal* about the new strike on the Engineer. He has over a hundred feet of ore exposed, ranging in thickness from 4 to 26 inches, which will mill a hundred dollars a ton. Mr. Kellum is hard at work getting the mine in shape to get out the ore, which he intends to have milled as fast as possible. The Engineer, the Reservation and the Good Luck are making a reputation for Gold Hill, and will produce a great deal of bullion the coming winter. The success these properties have made recently has started all the prospectors to hunting again, and in a few weeks all the vacant ground in the camp will be located.

OREGON.

A LITTLE DUBIOUS.—*Bedford Democrat*, Nov. 1: The prospects of the Cyanide Process of Baker County fulfilling their part of the agreement with the Eureka & Excelsior Con. Gold Mining Company are not as encouraging as they might be at this writing, but the company and its manager, Lawrence C. Goodrich, may yet surprise us. The continued absence of Mr. Goodrich in the East and his failure to let contracts for wood, as advertised in the *Democrat*, certainly look bad and tinges of something back of all the blow and bluster made a few weeks ago. Nov. 1st was the date set by Mr. Goodrich for a resumption of operations at Cracker Creek, and as yet no move has been made in that direction. No provision has been made for a wood supply at the mill and the snows of winter are not far off. If Mr. Goodrich intends keeping his promises with the E. & E. Co., as well as with the people of this community, there will have to be something done besides talk.

INTEREST PURCHASED.—It is understood that Mr. Johnson, a representative of Denver capitalists, recently purchased the one-third interest of the late Wm. Hervey in the Silver Crown mine, on Rock creek, for the sum of \$1500. The other two-thirds interests in the mine are controlled by Messrs. Dan Kelly and Sam Folt. The property is said to be developing beyond the most sanguine expectations of the owners, and is a mine that will yet make them independently rich.

WASHINGTON.

OKANOGAN.—*Outlook* Oct. 30: The mining interests in Okanogan county were never in a more healthy condition than at present. During the past season

many new and important discoveries, both in gold and silver, have been made and the year's work, which has about closed, has been altogether satisfactory. With the progress made this year it is reasonable to expect that 1892 will witness still greater activity in the working and development of our rich mines and prospects. There is every assurance that several mills will be built in this vicinity next year and that the railroad will be extended at least 40 miles nearer.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 3, 1891.

- 462,468.—SHOE—Geo. Bryant, S. F.
462,623.—FRICTION CLUTCH—H. P. Christie, S. F.
462,475.—SIGHT FOR FIRE-ARMS—F. W. Dobbel, Purissima, Cal.
462,666.—PUMP—H. J. Dykes, Peralta, Cal.
462,636.—PIANO ACTION REGULATOR—W. D. Gibbs, Los Angeles, Cal.
462,434.—FEEDER FOR THRASHER—Chas. Harrison, Davenport, Wash.
462,550.—PUMP MOTOR—C. C. Henderson, Centuria, Wash.
462,555.—SLEEVE HOLDER—H. L. Hoyt, Portland, Or.
462,437.—CONSTRUCTION OF FLOORS OR WALLS—P. H. Jackson, S. F.
462,490.—LEVER-POWER MECHANISM—John Kerwin, Beckwith, Cal.
462,569.—CURTAIN-POLE SUPPORTER—Emma Martel, S. F.
462,577.—CHECK BOOK—Edward North, Newhall, Cal.
462,326.—APPARATUS FOR TREATING ORES—A. B. Paul, S. F.
462,452.—ROTARY AIR-COMPRESSOR AND PUMP—H. Richman, Santa Cruz, Cal.
462,334.—ADDING MACHINE—A. Slavin, Tampico, Wash.
462,458.—BEDSTEAD—M. C. Taylor, Grass Valley, Cal.
462,645.—STRINGED INSTRUMENT—C. S. Weber, San Jose, Cal.
462,460.—AUTOMATIC ORGAN—G. F. Wells, S. F.
21,143.—DESIGN—C. H. Maish, Carson, Nev.

The following brief list by telegraph, for Nov. 10, will appear more complete on receipt of mail advices:

William T. Collier, Los Angeles, wardrobe; Earl D. Eddy, San Mateo, attachment for dental engines; Carol E. Gates, Oakland, fruit crate; Cotran T. Hall, San Francisco, hydraulic elevator valve; Legrand D. Harding, Colfax, Wash., differential in rolling-mills; John H. Hobart, assignor to T. M. Orahman, San Francisco, and N. H. Pine, Eureka, gold-saving apparatus; John B. Houston, San Francisco, metallic roll packing; Peter H. Jackson, San Francisco, damp-proof and water-tight cellar; James O. Kafader, Fort Bidwell, pipe punch and cutter; William Kidd, Fishermans Bay, Cal., cross-cut saw; Alexander J. McAdam, San Francisco, hydraulic elevator; William D. McCann, San Francisco, powder distributor; George W. McNear, Oakland, car construction; Joseph Moore, San Francisco, hose-holder; John F. Myers, San Francisco, stove for heating and lighting purposes; Charles H. Van Allen, Halsey, Oregon, mouth-piece for cornets; William Van Deventer, Tacoma, Wash., tail-piece for striged musical instruments; Albert E. Winlow, San Jose, Cal., buckle.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SHOE.—Geo. Bryant, S. F. No. 462,468. Dated Nov. 3, 1891. This invention relates to certain improvements in the construction of boots and shoes and it consists in forming the insole, to which the upper of the shoe is fastened, with a series of transverse grooves or channels across the top front part of the insole, and afterward securing to the shoe thus constructed one or more outer soles similarly grooved or channeled. Great difficulty is experienced in the manufacture of shoes to use a sole sufficiently thick to keep out the wet and for durability, and at the same time to provide a sufficient flexibility to make the shoe comfortable. These difficulties are claimed to be overcome by this invention.

ROTARY AIR-COMPRESSOR AND PUMP.—Henry Richman, Santa Cruz. No. 462,453. Dated Nov. 3, 1891. This patent covers certain improvements in rotary engines, which may be used for compressing air-pumping and similar purposes. It is one of that class of devices in which a circular disk or hub is fitted to revolve within an exterior case eccentric thereto, the hub having a sliding piston or pistons which may be alternately forced out at one side and the other, so that either one end or the other of said piston or pistons projects beyond the periphery of the hub and fills the space between it and the inside of the outer case, where the eccentricity of the two form such a space. The object of the invention is to provide certain improvements in the sliding pistons, a means by which they are alternately forced out and retracted, an automatically moving, self-adjusting packing fitted to the end of the pistons and a means for adjusting these pistons to or from the center of the hub.

SIGHT FOR FIRE-ARMS.—Fred W. Dobbel, Purissima, San Mateo Co. No. 462,475. Dated Nov. 3, 1891. This invention relates to that class of rear sights for fire-arms in which the sight is mounted and is vertically adjustable in a hollow standard hinged to a base which is secured to the gun-stock. The object of the invention is to provide a simple and effective means for the rapid adjustment of the sight. Quickness of action in this respect is of great importance, especially in hunting, as it often happens that the sight must be adjusted in the shortest possible time in order that the gun may be in readi-

ness for a sudden emergency. The ordinary sight in use is too slow for emergencies, as its adjustment is effected by the turning of a screw sleeve, which acts upon the threaded shank of the sight to raise or lower it. This movement is a slow one, and the necessity for its use may have passed before the adjustment can be effected.

BEDSTEAD.—Michael C. Taylor, Grass Valley, No. 462,458. Dated Nov. 3, 1891. This is an attachment to an ordinary bed by which it is rendered useful in handling sick and injured persons, those unable to help themselves, weak, infirm and aged persons and invalids. The invention consists essentially in a swinging arm attached to any portion of the bedstead and adapted to swing over and outwardly to one side of the plane of the bed, whereby the person can be suspended from the bed-arm and carried outwardly from over the bed while the latter is being made up. This bedstead can be used as an ordinary one but has an easily operated attachment called into action when the necessity arises, the purpose of which is to lift the patient from the bed and support him outside of it with comfort while the bed is being made up or arranged.

LEVER-POWER MECHANISM.—John Kerwin, Beckwith, Plumas Co. No. 462,490. Dated Nov. 3, 1891. The object of this invention is to provide a simple but powerful mechanism for such machines as toe-calk machines, shears, punches, tire-up-setters, etc., in which the material to be operated upon is placed between the opposing parts and is acted upon by said parts. The lever mechanism is specially applicable to machines having a movable part or jaw adapted to be forced upon the work.

CONSTRUCTION OF FLOORS OR WALLS.—Peter H. Jackson, S. F. No. 462,437. Dated Nov. 3, 1891. This invention relates to building basement, cellar or vault construction. The object is to increase the stiffness and strength of walls or floors of buildings without increasing their thickness, so that a building will remain integral as in condition of original construction, will resist tensile and compressive strain, remain erect under the weakening effects of fire, and will withstand earthquake shocks; furthermore to produce a construction of vault or cellar adapted for building where the ground affords a poor foundation; and also to produce a vault or cellar construction adapted for building where a larger surface than that enclosed by the walls of a building is required to support it owing to the earth being soft or wet beneath, and thus a poor resistant to the load above. With these objects in view, the invention consists in a building or similar structure comprising a wall or floor of two surface portions, each provided with metallic ties or small beams, whereby the wall or floor is stiffened and each portion made capable of withstanding strain; furthermore in a construction for buildings comprising a foundation, cellar or basement wall and a floor, both wall and floor being provided with metallic ties or beams joined, whereby the floor alone is made to form a firm, solid and substantial foundation for a building.

The Blasdel Concentrating Belt.

Saving a high percentage of sulphurets with the concentrator is of so much importance to mine-owners and millmen, that any improvement in that direction is likely to excite interest, and when proved a success, be met with a lively demand.

Among the several excellent machines now in extensive use, the part which has probably given most trouble to the inventors and builders, has been to secure a perfectly satisfactory belt.

While the belts now in use are doing good service and yielding fairly good results, it was the opinion of Ex. Gov. H. G. Blasdel, of Nevada, the inventor of the belt bearing his name, that room for improvement existed. This belief, based upon long experience and close observation of every detail connected with quartz milling, led Gov. Blasdel to give the subject careful investigation and to enter upon a series of experiments with the direct object in view at the time, of saving more, and a finer grade of concentrates than he had been doing at his mill in White Pine, Nev.

Success followed these efforts, and it was decided to place the improved belts upon the market, and to that end arrangements have been made to manufacture them in San Francisco. Orders for these belts can now be filled on short notice, in any width or length, and adapted to any of the Standard concentrators. The inclined flanged edge of the Blasdel belt enables it to pass over the rollers without breakage or strain, and, at intervals of four feet there are eight ridges for a space of three inches; these serve to distribute the pulp more evenly and prevents it from banking on the sides and forming channels through the center. These ridges also save very fine sulphurets (which are generally the most valuable), and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.

The inventor's claims for these advantages are endorsed by practical mill-men who have seen the belt work, as the respectable number already in use (between 30 and 40 in less than a year) prove. Some of the mills where these belts are being used and tested are, the Original Empire M. and M. Co., North Star M. Co., W. Y. O. D. M. and M. Co., California M. and M. Co., of Grass Valley, Champion M. and M. Co., Nevada City. The verdict from these and others has been decidedly favorable, and the manufacturer feels assured from the increasing number of orders and inquiries, that wherever concentrates are saved his belts will come into general use as their merits become better known. See illustrated advertisement on another page.

MECHANICAL PROGRESS.

Regarding Fuel Gas.

The practical failure of the natural gas supply for industrial purposes, not only at Pittsburgh, but in other gas districts, has led to a renewed interest in the subject of fuel gas. The fact which has ever been before the fortunate users of natural gas—that the supply, at best, was limited, and the day of its exhaustion, or at least the impossibility of its economical use for industrial purposes was near at hand—has made the subject of the best and most economical fuel gas one that has always been full of interest to the natural gas consumer, while manufacturers in those sections in which natural gas has not been found have looked with longing for a fuel gas process that would give them the advantages of natural gas at as cheap or even a cheaper rate than solid fuel was costing them.

It is not our intention in this article to speak of the various processes that have been invented but there is one or two points in connection with fuel gas and the different systems for its manufacture that have been proposed, to which we wish to call the attention of those interested in the subject.

The first desideratum of a fuel gas process in the minds of many who desire to use the gaseous fuel is that it shall necessitate but little change in existing plants. While there are fuel gas processes that answer this requirement, we think it will be proven in the long run that the greatest efficiency and economy in the use of fuel gases will not be found in the retention of old plants. The conditions under which solid and gaseous fuel are burned, are so different that a plant that is well adapted to the burning of solid fuel cannot be readily changed so as to burn a gaseous fuel with the greatest economy. All such changes are, in the nature of things, only makeshifts, and the highest economy will be in the erection of plants designed for the use of fuel gas.

We think it will be found also, that gases made by certain processes are better adapted to certain uses than they are to others. Fuel gases may be roughly divided into three classes—water gas, producer gas and what, for want of a better term may be called illuminating gas. Possibly a fourth should be added to these—sprayed petroleum, which is not really a gas. When petroleum is made into a fixed gas it should be included under one of the heads named.

It will be found that each of these gases has its own use to which it is better adapted than to any of the others. Water gas gives a very high degree of efficiency, but is somewhat costly. Producer gas can be made in great quantities at a cheap rate, but cannot be transported to any great distance, while illuminating gas is of a comparatively high cost and can only be used where the industry requires gas in no great quantities and can afford to pay a high price.

To typify the uses of each of these gases it might be said that water gas answers admirably for welding purposes, producer gas for large operations—like rolling mills—and illuminating gas for domestic purposes and small manufacturing.

While there are several fuel gas processes that have great merit it must, in all fairness, be said that there are a great many others whose performance hardly justifies the claims made for them. Some of the most absurd and impossible claims are daily made for the gas manufactured by certain processes. Most marvellous stories are told of the number of thousands of cubic feet of gas that have been made by certain processes from a ton of coal or a barrel of oil—statements that are as absurd as to say that two and two make fifty. Sometimes the promoters of these processes are self-deceived; in other cases they are simply dishonest and show their dishonesty when parties desiring to investigate their processes, with the hope of using them, begin to make close inquiries as to methods of manufacture, analyses, etc.

In making these remarks we have only referred generally to some points in connection with fuel gas that it will be wise for prospective users to bear in mind, and have by no means attempted to point out all matters that they should consider, nor even to discuss thoroughly those that we have pointed out.—*American Manufacturer.*

NEW METHOD OF STEEL MAKING.—H. H. Lake of London is the inventor of a new method in the manufacture of steel. Hard steel has hitherto been manufactured in crucible furnaces, and owes its properties to the carbon and various metallic compounds which have been incorporated therewith. It may be defined as an alloy of iron, carbon, and such metals as chromium, wolfram, copper, manganese and the like. Its properties are obtained by combining the several ingredients in predetermined proportions, and by eliminating as completely as possible the other substances, such as silicon and manganese, remaining in the metal. The method, according to this invention, is applicable to steel produced either in small or large quantities, and consists in preparing the bath in such a manner that, with a minimum of deoxidizing foreign elements, the carbon and the metals necessary for the hardening shall be added exactly in predetermined quantities. Converter or Martin-furnace steel

being obtained at the desired degree of decarburization, the bath is deoxidized by a sufficient quantity of silico-spiegel, whereby is introduced a minimum quantity of silicon and manganese, with traces of carbon, manganese and silicon passing into the scoria. A predetermined quantity of aluminum in the form of rich alloys is then added. The aluminum can be used alone as a deoxidizing agent. In any case, the two alloys may be employed separately; that is to say, successively or simultaneously, for preparing the bath before the addition of ferro-chroms or other metals, the proportion of which can be varied with the degree of hardness which is to be obtained.

The New Process of Chain Manufacture.

The new automatic process of steel chain manufacture, an English invention, and which has already been briefly alluded to in these columns, is now being largely introduced. Under this improved process, as described by a correspondent of the *American Manufacturer*, the chain is stamped out of a specially rolled mild steel bar, of which the section is a cross, with arms of a great length, and the links, which are weldless, are egg-shaped and have solid studs. These studs, the absence of welds and the homogeneity of the chain, combine to make it peculiarly strong, and its resistance is enhanced by subjecting the links to pressure.

There are ten processes, all of which, except two are automatic, and all are applied to the cold metal. There are seven punching operations, and when these are completed the bar presents the aspect of a rigid chain, every link being united to its fellow at what is the wearing surface of an ordinary link. To break the union the chain is run between a press which is V-shaped top and bottom. The links while rigid, are at right angles, each to the other, and the press comes down between them in the angle and presses them together. Fitting into the angle, the whole force of the pressure is concentrated on the neck of metal which connects the links. The first pressure all but effects the separation, and when the links are repressed through the press, and forced back into their original position, the separation is completed, the fracture being as clean as if it had been cut with a punch.

Initial Want of Success.

Before this process of separating the link was adopted, the chain was subjected to torsion for the purpose, the chain being put into a machine which twisted it first in one direction and then in another. But this process was found to fatigue the metal too much, and none of the one-half inch chain operated upon withstood the strain, each of them snapping before the process of wrenching one link from the other was completed, and the inventor has now therefore substituted the simple process of direct fracture described and this answers well enough.

Advantages Claimed for the New Chain.

M. Rongier of Birmingham, who is the inventor of the new process, claims that the new chains have double the tensile strength of the best forged iron, and further, that a half-inch chain made in this way has a higher breaking strain than an open-link inch cable, and weight for weight, a weldless steel cable is something above 30 per cent stronger than the best stud-link welded cable. The tools at present mounted are making half-inch chain at a total cost which is computed at £16 10s per ton of 93 fathoms. According to tests made at Lloyd's this chain is equally strong with a one-inch welded studless iron chain, which is produced at £12 per ton of 36 fathoms. It follows that a piece of the latter chain equal in length to a ton of the former costs £30.

THE GROWTH OF SEAMLESS STEEL TUBE BUSINESS IN ENGLAND has been very rapid, both in this country and in England. Birmingham is the chief center of the business in that country, and so great has been the increase in the number of firms who have embarked in the industry that the trade is in danger of being quite "overdone." Cycle makers and engineers are the chief consumers. Indeed, wherever metal tubing is required that has to withstand a great strain, and where steel can be used, the seamless tube is in growing request. It has added materially to the efficacy and durability of hydraulic machinery; a three-fourths-inch tube with a core of one-third inch can be drawn in steel to withstand a pressure of 1000 pounds on the square inch, and it is now, as my readers are aware, being largely used for boilers instead of copper tubing. It costs very much less, while its life is as long, and when made of high-class steel, it is generally found to be quite as reliable as, if not, indeed, more so than ordinary copper tubes. I may add that our Government is just now using a large quantity for the construction of search lights.

WIRE-WOUND GUNS.—Wire-wound guns have received some attention at the hands of the navy department, and the bureau of ordnance is contemplating further experiments with them. By the Longridge system, the inside tube of the gun is surrounded for the greater part of its length by a series of concentric layers of wire, lightly wound, over which is shrunk a cast-iron jacket, which includes the trunnions. The great beauty of a wire-wound gun lies in the fact that it approximates much more closely to the all-important principle of

perfect initial tension than the other forms of built-up guns, and it can thus withstand safely a much higher chamber pressure than the latter. The other great principle of gun construction, that of varying elasticities, is subserved in the Longridge system, to some extent, by making the tube and wire of steel and the jacket of cast iron.—*Exchange.*

SCIENTIFIC PROGRESS.

The Wonders of Nature.

Nature presents numerous phenomena which call forth the wonder and admiration of her students. These are exemplified in all departments of her domain from the starry firmament above, the magnificent scenic effects on earth, the wonderfully magnificent growths of her primeval forests, the beautiful effects of her floral kingdom down to her infinitely minute specimens of mineral, animal and vegetable microscopic productions. Among her remarkable productions and provisions none, perhaps, are more wonderful or inscrutable than the grand and absolutely imperceptible manner in which she passes from animal to vegetable life, and from the latter to animal.

We have been led to these reflections by a recent illustration of a compound life—an insect and vegetable combined—a crawling worm with a vegetable growth springing and flourishing from the upper portion of its body—not an isolated case, a vegetable and animal sprout, but a natural, consecutive production of generation after generation.

Soon after viewing this picture, our attention was called to a similar marvel, which is described substantially as follows: The Department of State at Washington has recently received from Consul Jones at Ohinkiang, China, a small bottle containing some specimens of a curious fungus that grows out of a species of caterpillar, literally transforming the animal into a vegetable and causing the unhappy insect to serve the purpose of a root. It is the larva of a kind of moth which, when the cold of winter approaches, makes its way down into the soil to the depth of three or four inches. While thus encased it is attacked with a remarkable disease or permeated with a peculiar germ, from which a shoot is sent up above the ground, where it grows and fructifies much like a mushroom, forming spores for the purpose of its reproduction.

The natives of Thibet, where this remarkable production is common, go about looking for this fungus in the neighborhood of a certain sort of myrtle, near and under the branches of which only it is found. They dig up such specimens as they discover and make them up into little bundles, tied with red thread. In this shape they are sold as a medicine, which is esteemed, if possible, more highly than the famous ginseng, being considered a powerful curative agent for diseases of the throat and lungs. They are thus prepared for market, in little bunches, each sprig having for its root a mummified caterpillar.

Now, this fungus has no other method of growing than the one described. Therefore, the fructifying top that is above ground sends its spores around under the scarlet-flowered myrtles on which the caterpillars feed. When the latter borrow into the soil to hibernate, they stir up some of the hostile germs, whereupon they are at once attacked and speedily transformed into vegetable tissue. Their bodies, without losing their natural shape or external appearance, are wholly filled with the mycelium, and the substance of their flesh is metamorphosed into stalks sprouting from their heads.

Thus is afforded the remarkable spectacle of living organisms which are insects in summer and plants in winter. Of course, a sufficient number of these afflicted larvae must escape this fate to perpetuate their species from year to year and to supply reproductive opportunities for the fungus.

THE DIPPER AND THE NORTH STAR.—Most people in a clear day, can, without a watch or other timepiece, form a closely approximate idea of the time of day by the position of the sun; but few, perhaps, have guessed at any similar method of computing the time during the night without any other means than the "starry skies." Notwithstanding, a fairly reliable time indicator can be found in the northern skies on every cloudless night. As is generally well known, the group of fixed stars called the "Dipper" makes an apparent revolution around the North star in every 24 hours, with the two stars forming the outer elevation of the bowl of the dipper pointing nearly directly to the polar star continuously. If the position of the "pointers" is taken at any given hour, say six o'clock in the evening in winter time and as soon as it is dark in the summer, the hours can thereafter be pretty accurately measured by the eye during the night. Frequent observations of positions will have to be made at the given hour, as, owing to the constant changing of the earth's position in space, the position of the "pointers" in relation to our point of observation and the star, also change. Observations taken during a year and impressed on the mind will make a very good time indicator of that part of celestial space.—*Mechanical News.*

A NEW SMOKELESS POWDER.—Professor Charles E. Munroe, a graduate of Harvard

University, has produced a new smokeless powder which has been tested at the United States naval ordnance experiment grounds, and is said to have given eminent satisfaction to the government officials. Eleven rounds were fired from six-pounders, a charge of 400 grammes giving a velocity of 1960 feet and a pressure of 16 tons; with a charge of 392 grammes the velocity was 1920 feet and the pressure 14 tons. With the ordinary service charge of 820 grammes of black powder, the velocity was 1800 feet and the pressure 15½ tons. The results obtained with three-pounders are said to have been still better, the trials comparing well with anything that has been done in Europe. The new powder is almost entirely smokeless, but it is necessary to use with it a small priming charge of black powder, which causes a slight puff of grey smoke that quickly disappears. Gun-cotton is stated to be the basis of the new powder.

PICTURES IN SULPHUR.—Our readers are already acquainted with the fact that molten iron, when cast upon ordinary writing or printing upon paper, will take a perfect mold of such writing or printing, which will be plainly discernible upon the face of the casting; and now comes the announcement that the same result can be obtained from sulphur when pressed, in a fused state, over any picture or words lithographed upon paper, and, presumably, writing as well. Charles Lepierre, in the Bulletin of the Society of Chemistry, Paris, says that: "In demonstrating that sulphur melted at about 115 degrees can be cooled in paper, the author happened to use a lithographed card, of which the edges were turned up. Upon taking away the card he discovered that the lithographed characters were clearly and distinctly impressed upon the cooled surface of the sulphur, and remained after hard friction and washing. By repeated experiments he has been able to get very fine results, removing the paper each time by a mere washing and rubbing process. He finds that sulphur will receive impressions from and reproduce faithfully characters or designs in ordinary graphite crayons, colored crayons, writing ink, typographical inks, china ink, lithographic inks—colored or uncolored—and others. He remarks, too, that it will reproduce with remarkable exactitude geographical maps."

OREXIN.—Dr. John Gordon reports in the *Lancet* on his results in the use of hydrochlorate of orexin, as an appetizer. From these he concludes that, in the loss of appetite concurrent with tubercular disease, orexin is a valuable stimulant. The power of stimulating absorption of the products of digestion claimed for it, seems to be merited, for under its use, as a rule, the tongue becomes less furred, and constipation relieved. It is worthy of receiving an unbiased trial in suitable cases. It may be given, he says, either well diluted in water or made into pill form with any of the ordinary excipients, and can also be given between thin slices of bread or butter or in the form of wafers. The cases in which he tried it were those of children, to whom the drug was given in small doses and simply dissolved in water. Little or no objection was offered by the children to its administration.

MORE NEW DYES.—Three new shades of diamine blue have been recently introduced by Messrs. Leopold Cassella & Co. The diamine blue 2 B and 3 B give very pretty shades. These blues are not turned red by the action of alkalis or hot pressing, an advantage not shared by any other direct blue dye. A fast neutral violet B is another new dye specially suited to cotton printing. Cotton can be dyed in the usual way on tannin and tartar emetic mordant. It will be found useful as a substitute for alizarine and methyl violet, especially for the deeper shades, as under these conditions the new violet does not develop a bronzy tinge.

RAIDING OUR CLIFF DWELLINGS.—Baron Nordenskjöld of Sweden, who secured permission to visit the cliff dwellings on the reservation near Dorango, Colorado, with the understanding that he would neither destroy nor carry away any of the relics, went upon the work of general devastation upon arriving there. He has shipped several boxes of relics to New York. When the baron reached Dorango upon his way East he was arrested by a United States marshal, charged with robbery, and will be prosecuted to the fullest extent.

A PERSONAL VOCABULARY.—The vocabulary of a citizen of the United States, with a common-school education and of ordinary intelligence and reading, is about 10,000 words, and that of a well-read college graduate and of those who have pursued a university course, at from 20,000 upward to perhaps 100,000. One's vocabulary is usually nearly complete at 30 years of age. If but two words are learned each day, the vocabulary at that age would be only 20,000. Records show that young children acquire new words more rapidly than that.—*Science.*

NUMEROUS ISLANDS.—It is said that between Madagascar and the coast of India there are 16,000 islands, only 600 of which are inhabited. The climate in those islands is so productive of food that a man can support a family there, in all those island luxuries, by the work of only 25 days in a year.

ELECTRICITY.

The Improved Uses of Electricity.

Dr. Louis Bell recently read an interesting paper before the Franklin Institute on "Electricity as the Rival of Steam." The author, in the course of his paper, remarked that we must still look upon electricity not in any sense as a prime mover, but simply as a powerful and convenient means of transmitting power from one point to another. It was also to be inferred that only in exceptional cases could anything but steam be employed as the prime mover. This inference was necessary because, up to the time of the writing of that paper, we had no means of transmitting power by water for any considerable distance, five miles being the longest distance of transmission, and even that at a very great loss of power.

Since that time, however, the Frankfort experiments have shown that electricity may now be transmitted upward of 100 miles, at a less loss than has heretofore been met with in a five mile distance. This fact has added immensely to the possibilities of the uses of electricity. By this increased control over the electric current, it is possible to utilize water power from great distances, and streams which have heretofore been considered of little or no worth are now regarded as of great value. Water-power may now be economically and safely transmitted from any of our mountain streams into any or all of our great interior valleys and made to do all that steam can do on the spot. Such power may be made to light cities, run factories or drive trains of cars on our railroads. Power may be "hotted up," so to speak, and sent along a hundred miles of wire or more at a slight expense, divided up to any desired extent, and made to do all the work required of any power at any desired point. By this means, after a plant is once installed, the cost of power will be light—a mere bagatelle of what it is now.

Electricity on the Railroad.

We have already in previous issues, alluded to the new possibilities of what electricity may shortly accomplish in the way of displacing steam on our great railroads. There is only one man in the world whose opinion would be accepted for what he promises in the near future. That man is Thomas A. Edison. Mr. Edison, in speaking of electricity displacing steam, says: "It will displace it, if economy as well as speed and safety, is a factor of locomotion, not because it will make easily a speed of 100 miles an hour, while steam strains itself to make 60, but because it will get one horse-power out of from one to two pounds of cheap coal (water-power), while out of six pounds of dear coal a locomotive engine can only get that same one horse-power. It will displace it because it will be cheaper."

Thus this greatest of inventors unhesitatingly announces the early ending of the present era of steam, and the birth of the new and improved, but not yet perfected era of electricity.

It is expected that the first authoritatively practical evidence of its wonderful achievement will be made at the Columbian Exhibition in Chicago—a most appropriate beginning of a new era of progress at the ending of the first 400 years of any real industrial progress which the world has ever made.

Mr. Edison declines to go into full details of all that he has in hand at this time, as he has not yet secured European protection and possibly has not fully perfected all his details in regard to moving overland trains. "But," he says, "I will say briefly that the current will pass from the stationary engine to a central rail between the tracks, thence through the mechanism attached to the bottom of the cars or motor, (a freight train, of course, would need a motor, because of the number of cars, although a single passenger car could be run, carrying its own motor beneath it) thence to the wheels and thence back by the side rails to the power-house or stationary engine. Three of these stationary engines with a horse-power of 10,000 or 12,000 each would run the whole Pennsylvania railroad system between Chicago and Philadelphia; freight, local, express trains and all, and at a great reduction of expense."

In alluding to this street car problem, Mr. Edison illustrates his low power system, which makes the transmission safe and at the same time all-powerful, as follows: "You see I employ the heavy current with the low pressure. That is the whole secret of safety. The principle is this, that a stream of water 100 feet wide, which falls a foot, gives the same power as a stream one foot wide which falls 100 feet. The wide stream is my way, the high fall some other people's and the allowance of such pressures in public streets as some that are used, is like letting a man place a boiler in a vault under a street and put on 1000 pounds of steam if he wants to do so. Electricity has developed too fast, you see, for the law to keep up with it. The whole question is one of expense. A low pressure trolley wire, for instance, occupies four times as much copper as a high pressure one. This system is the cheapest known and does not cost half as much as the cable."

A SIMPLE VOLTAIC BATTERY.—A novel and simple form of electric battery has recently been invented in Italy, and is described in the London *Electrical Engineer*. It consists of conical vessels of cast iron and porous earthenware, with nitric and sulphuric acid. An iron

cone is placed point downward in a stand, and is partly filled with strong nitric acid. Into this is placed a cone of porous earthenware containing dilute sulphuric acid. Then follows an iron cone, surmounted by an earthenware one, and so on in a series, each vessel containing its respective acid. It follows that the inner surface of each iron vessel is bathed in nitric acid, and becomes passive, acting the part of the platinum or carbon in an ordinary cell. The outer surface is attacked by the dilute sulphuric acid, and takes the place of the zinc. There are no connections to make, the simple building of the pile putting all the parts into motion. The earthenware cones are eight inches in diameter and four inches in height, and contain 550 cubic centimeters of 10 per cent sulphuric acid solution. The iron vessel contains 110 cubic centimeters of nitric and sulphuric acids—the latter being three times the volume of the former. Sixty elements in two piles have a resistance of 104 ohms, an E. F. M. on an open circuit of 81 volts, and on closed circuit of 45 volts, with a current of 4.4 amperes. After five hours, the difference of potential falls to 28 volts, and the current to 2.7 amperes.

Perversion of the Term "Electric."

Electrical Review very properly says the word "electric" is perverted to base uses. "To the uninitiated, this word carries a world of mysterious, subtle and powerful meaning. We see extensively advertised the merits of electric hair curlers, electric soap, electric tooth brushes, electric knife sharpeners, and hundreds of others. This is a swindling prostitution of a noble word to help the sale of articles not connected in any manner with anything electric. The onus for this lies in the education of the public in matters electrical, so that they may know of their own knowledge what to trust and what to avoid, when they see or read anything 'electric.'"

A contemporary of this city, in copying the above, adds the following, which is not only cumulative, but also quite to the point: "We remember a year or two ago, when the California Electric Society was being organized, a notice was put in the different dailies, asking those interested in electrical matters to meet at a certain hall. When the evening came, the hall was well filled, but many present looked like cranks that had made their escape from some asylum. They turned out to be 'electric doctors,' 'electricians,' as they called themselves, who had been attracted by the word electrical. There is another class of men that misuses the word. They are the bell-hangers who advertise themselves as 'electricians,' and lastly, we have the men who, having oiled a dynamo for a few months, come out as full-fledged 'electrical engineers' and 'experts.'"

It is unfortunate that such a good word should be put to such base uses, but so long as the world is filled with fools who believe what they hear, but do not understand, the evil will go on unchecked.

HOW SEVEN ELECTRIC SHOCKS FEEL.—Conscious motion is not a proof of suffering from an electric shock. Moreover it is well known that a severe shock of electricity may produce unconsciousness when the result is not fatal. Franklin describes an experiment in which he knocked down six men at once by an electric discharge of which they did not see, hear, or feel anything. The following experience, however, says Dr. C. A. Perkins, in the *Electrical World*, is different from anything that has ever come to my notice. Mr. H. was working on a trolley car. He was wearing at his work an old pair of shoes with iron nails and no insoles. Standing with one foot on the rail of the dashboard he took hold of a wire that was accidentally connected with the trolley line, and at once received the whole force of 500 volts. He was unable to call for assistance, but was sufficiently conscious to know that he must pull his hand off the wire and break the connection, and by a strong exertion he succeeded in doing this, wrenching his hand away and falling over. By some chance he turned around as he fell, striking on his knees and shoulder, and so escaped any serious injury from the fall. The curious thing about it was that he suffered no pain during this time and did not feel the blow of striking the ground, but imagined that he was a great bird, sailing slowly round and round, finally lighting on the ground. He was able to get up immediately, and beyond feeling lame and stiff from the fall experienced no bad effects from the shock. This condition of semi-consciousness seems to be about as far as one could go without fatal results if he were dependent upon his own exertions to extricate himself. It seems, however, that even conscious motion under such circumstances is not proof of suffering.—*Exchange*.

COMPARING THE ELECTRIC WITH STANDARD CANDLE LIGHT.—In a communication to the Paris Academy, M. A. Witz states that the efficiency of an arc light is about .05, while that of a standard candle is only .01, and that of the best regenerative gas burners is perhaps .02. He mentions that in the town of Lille gas lighting has been supplanted by a system of glow and arc lamp, driven by a gas engine, and they have proven so much superior that 15 per cent more light is obtained, while the consumption of gas in the engine is 17 per cent less than was before required for direct lighting by gas.

GOOD HEALTH.

Effects of Overeating.

It is a settled fact that the average American eats too much, and especially is this the case during the long hot days of the summer season. In winter any excess of food may be stored up as a reserve supply, furnishing a protection, as it were, from the severity of winter's blasts. During this season, most men are gormands and form gormandizing habits. When the summer comes on, with its excessive heat, this extra supply of fuel is not called for, and yet your average American, never stopping to think that a change in diet must be made to suit the change in surroundings, continues to stuff that "aching void" with pork, beef, beans, and all the rest of the heaviest, most nutritious food-stuffs. His digestive tract is overloaded. Under the enervating influence of the heat, and the consequent inactivity of the muscular system, the digestive tract loses its tone, its power of handling the immense quantities of stuff thrown into it, and as a result it is not long ere strange misgivings enter the mind of your gluttonous individual. The world seems to go wrong. All things seem out of joint. He eyes the bootblack, who looks up innocently with the business-like remark "Shine?" with a suspicious scowl. His digestive tract is out of shape. Nine-tenths of the disturbances of the alimentary canal are due to indigestion feeding. Now, you who read, pay attention! Your stomach is not a bag of rubber, to be stretched to its greatest powers of endurance, nor should the sensation of complete satiety be taken as the index of the quitting point. Stop at the point of moderate satisfaction, and allow your stomach to resume its natural condition of moderate dilatation. Under these conditions, the digestive tract will take up the food, handle it thoroughly, abstract all materials requisite for the healthy nutrition of the body, and you will go on your way rejoicing.—S. A. G., *Texas Health Jour.*

STAMMERING.—The following remedy for this annoying trouble is highly recommended by a distinguished French physician: Draw a long breath so as to fill the lungs to their utmost extent. Divide the sentence you wish to speak into syllables, marking time for each syllable by bringing the index finger and thumb of the right hand together, or marking time with the foot. Now, here is a specimen: "Pass-me-the-bread. Good-morning-madam-how-do-you-feel-this-morning?" These syllable exercises must be practiced for at least one month, then a cure should be accomplished if the patient has no deformity of the throat or larynx and if the front teeth are sound. There is nothing easier than this cure; it is simply to speak in syllables for one month, and is within the easy reach of everybody—man, woman or child. Very few women or girls stammer, and they are the easiest to cure. I advise all parents to try and cure their children when they are young, if they stammer, and thus save them a life of misery. This cure was given in the *Old Household* ten years ago. Reading with the mouth shut will never cure stammering. Speaking in syllables is the cure of Dr. Colombat of Paris, who cured thousands and made a fortune.

A POSSIBLE REMEDY FOR SNAKE BITE.—It is well known to many that the Indians of Southern California have very little dread of the bite of a rattlesnake, as they always have what they consider a sure remedy at hand. When bitten, they immediately gather some of the leaves of the common mock orange—"golondrina" of the botanists—a vine which trails on the ground and produces a gourd which presents an exact resemblance to the orange. This vine grows almost everywhere in Southern California. In application, the leaves are macerated and formed into a poultice which is applied to the wound. The macerated leaves are also placed in water, and a decoction from the same used freely as a drink. We have never seen this statement contradicted; neither have we ever heard of its being verified by any physician. Here is a chance for some physician to render a noble service to humanity by experimenting with this plant on some small animal and reporting the result. If successful, some way might be devised for preserving the leaves and preparing a drink which might be placed upon the shelves of druggists and used in localities where the plant is not known and does not grow.

FRECKLES AND THEIR TREATMENT.—There are two kinds of freckles. Some people are born freckled and others have freckles thrust upon them. The former class might as well accept their freckles as a dispensation of Providence, for nothing can be done for them. The latter can always get rid of their affliction by using a couple of drachms of salomoniac with an ounce of German ointment, the solution mixed with a pint of distilled water. Applied two or three times a day, it will cure the worst case of acquired freckles on record. Another remedy is fresh buttermilk. It has the great advantage that it does not injure the skin, but renders it soft like a little child's. Take a soft cloth or sponge and bathe the face, neck and arms thoroughly with buttermilk before retiring for the night, then wipe off the drops lightly. In the morning, wash it thoroughly and wipe dry with a crash towel. Two or three such baths will take off all the tan and freckles. It will keep the hands soft and smooth.

NEW REMEDY FOR HAY FEVER.—An English physician, Dr. Lennox Walnwright, affirms that a mixture of menthol and carbonate of ammonia has proven to be the best remedy for hay fever. It is used as smelling-salts.

USEFUL INFORMATION.

THE MANUFACTURE OF SPECTACLE LENSES.—The forming of lenses for use in making spectacles is by no means a small job. The glass is treated to a number of processes, and when it comes out complete it has passed through considerable. First, the bit of glass to be used is made fast to a block of hard rubber, so that it may be handled more readily, plough being employed to fasten it. What is known as a "rough tool" is first used. This tool is of cast iron, having a curvature equal to that desired in the lens, and revolves very rapidly on a vertical spindle. It is kept moistened first with a coarse grade of emery and water, and the bit of glass is pressed against it. As this process continues, the grade of emery used gradually grows finer, and when thorough with the grinding, the glass is left with a rough surface and has lost its transparency. The next tool used is the "fine tool," which is of brass with the truest possible surface, and which is kept covered with rouge. In order to assure accuracy, comparison of the glass is made from time to time with a standard curve. Next comes the polishing, which is done by pressing the glass against a piece of cloth, fastened to the rotating tool and covered with the rouge. The lens is then ground on the reverse side, and, as far as polish goes, is complete. It must now be cut into the proper shape. This is done by means of a diamond. The lens is laid on a leather cushion and held secure by a rubber-tipped arm. An oval guide is then laid on the glass and the diamond run around it. A pair of steel pincers removes the superfluous glass from about the edges, and after having these edges ground smooth, the lens is ready for mounting.

SAWING STONE.—French ingenuity has contrived an improved stone-cutting saw of remarkable efficiency—a circular saw having its edge set with black diamonds in the same way as the straight blades, but as the strain on the diamond is all in one direction, the setting can be made much firmer. Moreover, as the movement of the circular saw is far more rapid than that of the straight one, the effect of the diamond teeth is increased by the force of the impact upon the object to be cut without the exertion of more power in propulsion. In order to keep this kind of a saw at starting in perfect plane, it is made to revolve between two pairs of guides, but as soon as the cut in the stone is deep enough to serve as a guide, the temporary ones are removed, the consequence of this management being that the out surfaces of the stone, instead of being wavy, so as to require subsequent dressing to a plane surface, are quite straight and smooth, needing only to be polished. The stone to be cut is pushed against the saw by a carriage similar to that used in sawing wood, and the rapidity with which it is divided is very great. At one establishment where two saws are in use, the green Alpine granite is sawed at the rate of nearly an inch a minute, hard marble at three inches a minute, and marble of moderate hardness, also hard limestone, four inches a minute.—N. Y. Sun.

BLASTING PAPER.—Almost any good unsized paper can be made into an explosive compound by coating it with a hot mixture of yellow prussiate of potash and charcoal. Take each of these, 17 parts, mixed with refined saltpetre, 35 parts; chloride of potassium, 70 parts; wheat starch, 10 parts, and water, 1500 parts. The ingredients must be dissolved until they form a clear solution in the water. Dip the paper and soak it in the solution until it is thoroughly wet. It then may be dried, rolled into cartridges a dried in the ordinary manner, either with a fuse or with detonating caps similar to those used in firing cannon or dynamite when used in blasting ledges. Blasting paper is especially useful in operating the gun-powder pile-drivers, as several thicknesses of the explosive paper may be placed on top of the timber together with an explosive cap, and fired by impact of the ram as it falls from the previous stroke. Cartridges of this paper may be rolled to any desired size, and are very handy when blasting a wheel pit or flume, as the cartridges can be made of exactly the size to fill the drill hole.—*Mechanical News*.

HAS NO GALL BLADDER.—Nothing on earth will upset a horse's stomach, according to *London Truth*. This is not because the horse does not feel pain, but simply because the horse has no gall bladder. Has anybody ever seen a horse sick at sea? Has anybody ever known an emetic to have any effect on a horse? At a bull fight a horse may be seen eating with its entrails trailing on the ground. As for the contention that a horse is not as sensitive to pain as man, I think that a horse is probably a great deal more so. There is no living creature, not even a hysterical woman, so nervously sensitive as a horse.

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Business Announcements.

(NEW THIS ISSUE.)

Delinquent Sale Notice—New El Dorado Gold Mining Co. Delinquent Sale Notice—California & Arizona Mining Co. Assessment Notice—California Verde Antique Marble Co. American Exchange Hotel.
Assaying Business Wanted—E. D.

See Advertising Columns.

Passing Events.

The commencement of thorough experiments to test a method of economical working of low-grade Comstock ore, is an important thing for that section. In fact, an entire reorganization of the milling customs up there would doubtless be a good thing, and would give people more confidence in investing in the mines, with a view to dividends.

The advance in the application of electricity to mining has been very great recently, and the PRESS is taking some trouble to present the subject to its readers from week to week.

There is quite a flutter among political horses and politicians in this city, owing to the action of the Grand Jury in investigating certain actions in which bribery and corruption are apparent. Indictments have already been filed against some of the more prominent, and more will doubtless follow. The men who have been guilty of accepting bribes for official acts ought to be punished, and for the first time in many years, indications point to some definite action in that direction.

GARNETS.—Garnet mines are not so numerous in this country as gold and silver mines, says the *Lower Californian*, but they are here, though. J. M. Brown and his partner, just in from the desert, report finding a mine of real garnets in the Carga Muchacha range of mountains. The mine is situated in United States territory, not far from the only spring in a section of country many miles in

area, and the garnets are said to be there in great quantities. They are a brilliant cherry-red in color, some of them black, and many as large as peas and perfect in shape. By sandblasting they can be rendered very beautiful and valuable. The discoverers have each taken up 20 acres of land on which the mine is located.

A Nevada Mining Law Ignored.

There are mining incorporation laws in this State, which are, so far as many mining companies are concerned, a dead letter, and it is for the recognition of these laws that the MINING AND SCIENTIFIC PRESS has made a strong fight, so that the proceeds derived from all bullions sold will be honestly divided, after all legitimate expenses incurred are paid. If these laws were faithfully carried out by mining officials, there would not be any just grounds for complaint from shareholders not members of favored rings.

While the laws in this State are being disregarded by some of the companies incorporated under them and working mines in Nevada, it appears that some of the mining laws in the latter State have not been conformed to by them. Notably is this the case when assayers fail to keep a record of all assays, purchases and sales of amalgam, and also of the bars of bullion, made by them. The history of this law being enacted by the State of Nevada, is briefly stated as follows: Several years ago, during the "bonanza firm" days, John W. Mackay discovered that some one was unlawfully appropriating amalgam from one of his mills, and as the law did not compel assayers to make, as stated above, a record of their purchases and sales of amalgam, and also of the bars of bullions made by them, he was unable to trace the loss to any particular person or persons, consequently, at the session of the Nevada Legislature he was mainly instrumental in having the following law passed:

4713. Sec. 1. Every person or firm now engaged in, or who may hereafter engage in the business of assaying within the State of Nevada, shall make and file, at the end of each and every month, with the County Clerk of the county where such business is pursued, a sworn return, subscribed with the name and verified by the oath of the person having the charge and control of such business, which return shall set forth the name and place of residence of every person within such month depositing or selling bullion or amalgam for melting, retorting, refining or assaying, together with the date of the deposit, the amount then deposited, the names of the mine and mill, blanket, sluice or other source from which the same was obtained.

4714. Sec. 2. Every person or firm within the State of Nevada engaged in or carrying on the business mentioned in the first section of this Act, who shall neglect or refuse to comply with its provisions, or any of them, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by fine of not less than one thousand dollars and not more than five thousand dollars (\$5000), and shall be imprisoned in the county jail not less than one month, nor more than six months, for each and every such refusal or neglect.

The above plainly worded law has been ignored probably by virtue of conditions brought about by the reported "mill ring" said to have been formed in 1885 and 1886. Last August, Wm. T. Baggett, attorney for the Mining Stock Association, was in Nevada compiling the bullion return of the Comstock mills and mines covering a period of several years back, and finding no record of large quantities of bullion which had gone into the hands of private individuals in place of the mines from which it was taken, and desiring to trace this valuable bullion from its fountain-head to its final resting-place which, is said to be in the pockets of a few favored individuals, he applied to the County Clerk of Storey county for the record filed with him. No such record having been kept, and some of the assayers being defiant, Mr. Baggett informed the District Attorney of the county that the law was being disobeyed. As a result, we find that the Con. Virginia assay office was the first to comply with the law and file its September work in accordance with the act. Considering the fine and imprisonment clause, it would seem advisable for the other assayers to follow the example set by the Con. Virginia assayer before some citizen feels obliged to force the District Attorney to proceed against them and put this most important law in the interest of mining shareholders into effect in a manner that will cause the disobeys to remember that laws cannot be disregarded much longer.

Comstock Low-Grade Ores.

It is stated that the Comstock Companies are to give the use of the Mexican mill, now lying idle, to Louis and Alexis Janin to test the Janin process for working the low-grade Comstock ores. What the nature of this process may be, is not made public in detail, but it is said to have worked satisfactorily in Mexico, where the percentage saved has been high, with some slight reduction in the cost of working. The Janin brothers are to carry on the work at their own expense, the companies to furnish mill and power. No new machinery or additional labor will be required for this process, the same appliances and staff of men answering all purposes.

It is a subject of congratulation that these important experiments are to be made by skilled and educated gentlemen who understand their business. They are both experienced mining engineers and metallurgists of the class to whom all such experiments should be referred. It has been unfortunately the case too frequently in the past that such matters have been entrusted to men with no professional education or experience.

It is pretty certain that the mining and metallurgical interest of the coast would have been better off to-day had educated mining engineers been employed instead of the class who too often have charge of important works. The examination of mines, the determination of process, and all such matters, should be referred to the professional mining engineer. The so-called practical man can carry out the work, but it should be under the supervision of one who has more than local experience.

The experiments with the ores on the Comstock will surely be carried on by the Janin brothers in a way which will leave no doubt as to results. There is no danger of a glowing report being made unless conclusions warrant it. It is greatly to be hoped that these experiments will be successful, and that a way will be found to utilize the low-grade ores of the famous lode.

River-Bed Dredging.

We have received a note from the Superintendent of the Carson River Dredging Co., enclosing a paragraph from the *Lyon County Times* (Nev.), contradicting the statement concerning the change in method of dredging, which we had copied in the PRESS of Oct. 31st from the *Virginia Enterprise*. The latter paper stated that the dredging machinery was to be done away with, a railroad built upon the bank of the river and the machinery placed on a car. This statement we copied, and commenting upon it, prefaced the paragraph by a statement that dredging operations for gold in rivers in California had not been successful, though in Australia some success had been met with. The *Lyon County Times* says:

The dredging scheme has not proved unsuccessful on the Carson river any further than that the company has never had the right kind of dredge for the work. The suction dredge which was first put on to recover quicksilver alone did not work, and the scoop dredge next put on failed because it was never intended for the work required by the company. The machinery now being put upon the boat is being made by the Golden Gate and Miners' Foundry of San Francisco. Mr. Angell, a representative of the foundry, visited Dayton a few months ago and saw exactly what was wanted. He is now putting up an endless chain bucket dredge, which he guarantees will do the work required by the company. Articles such as appeared in the PRESS are misleading and should be corrected.

This simply proves what was editorially said in the PRESS of the date referred to, as follows: "Over in the Carson river, Nev., for some years experimental dredging operations have been going on for rich tailings and quicksilver, but as appears further on, no success of moment has been met with, and the plans have had to be radically changed."

The PRESS has no desire to throw out any false impressions that may injure a persevering and legitimate mining proposition; but the fact remains that the dredging on the Carson river is still in an experimental stage after several forms of machinery have been tried. As to the paragraph from the *Enterprise*, that is incorrect, as the one printed above from the *Times* shows.

We shall be very glad to chronicle a success on the Carson river, especially as we never have made a success of such enterprises in Cali-

fornia. It is but just to say, however, the Carson scheme is to get up tailings, while in this State we have gone after original deposits—and never found them. As stated in our original article, they are working dredges in Australian rivers, and one of the machines used there—invented in this State—is illustrated in this week's PRESS.

The Height of Mt. St. Elias.

[Written for the PRESS by MARK B. KERR.]

In a recent dispatch from Washington appears the notice that Prof. Israel C. Russell has established his claim that Mt. St. Elias is the highest peak in North America.

As topographer of the expedition of 1890, I feel somewhat responsible for the approximate result obtained by us on this survey, and a few remarks upon the great discrepancy existing in the different estimates, as well as the method used by us in determining its elevation and position, may prove of interest at this time.

Since 1741, when Bering discovered the great peak, there have been seven different estimates made for height and position, and these are tabulated below:

MT. ST. ELIAS.		
Date	Authority.	Height in feet.
1786—La Perouse.....	12,672
1791—Malaspina.....	17,851
1847—Tebenoff.....	16,938
1872—English Adm. Chart.....	14,970
1874—U. S. Coast Survey.....	19,500
1890—National Geographic Society and U. S. Geol. Survey.....	15,350
1891—National Geographic Society and U. S. Geol. Survey.....	18,500

*Within 500 feet.
These different results show a range from 12,672 feet to 20,000 feet.

Up to 1874, the height was obtained by observations from a point at sea, by trigonometric survey, with unclosed triangles, the sides of the triangles being always long and coefficient of refraction assumed.*

The work of the expedition of 1874 would have forever set at rest all conflict as to height and position, but only one point of the base line was permanently established on land, the other end being far out to sea and not inter-visible. The knowledge of this uncertainty led to the exposition of 1890.

In 1890 we measured a small base line, 3850 feet in length, on permanent ground, deciding it better to have this fixed base and extend our triangulation from it, than to measure a longer base over shifting moraines of dirt and ice.

The accidental loss of the transit made resort to an inferior instrument necessary, and this combined with the region traversed (the line of travel being too direct for a proper development of triangles) would not give the highest value to this determination of position and altitude, but within the approximate trigonometric control, the limit of probable error is readily obtained.†

The angles of intersection on Elias are all small. As the ascent of the mountain was not our prime object, we were too late to succeed in reaching its summit, although we missed it by only a few hours.

Combining all angles with the compass angles taken at end of season of 1890 at Port Mulgrave (one end of the assumed base line of expedition of 1874), a distance Mulgrave-Elias is computed 56.16 miles within 5 miles.

This distance was computed in 1874 at 69.10 miles. All this shows that these discrepancies are entirely due to the difference in determination of distance.

It was hoped that the expedition of this season in charge of Mr. I. C. Russell of the Geological Survey would settle the question by succeeding in reaching the summit of the great peak.

But until a set of systematic observations has been approved by the National Geographic Society, the Geological Survey, or some well-authorized Government or private expedition, doubt will be felt by the scientific world as to its exact height and true position.

So the ambition of mountain-climbers the world over has been provoked by these different failures, and their desire strengthened to take its scalp. But one thing is certain—the American flag should be the first to float over Mt. St. Elias, and may the man who puts it there arrive when the tide of its elevation is on the ebb.

*Coefficient of refraction used in computing heights in this vicinity, determined by Prof. George Davidson, U. S. Coast and Geodetic Survey.
†Independent result obtained from Kerr's notes by E. M. Douglas, Topographer U. S. G. S.

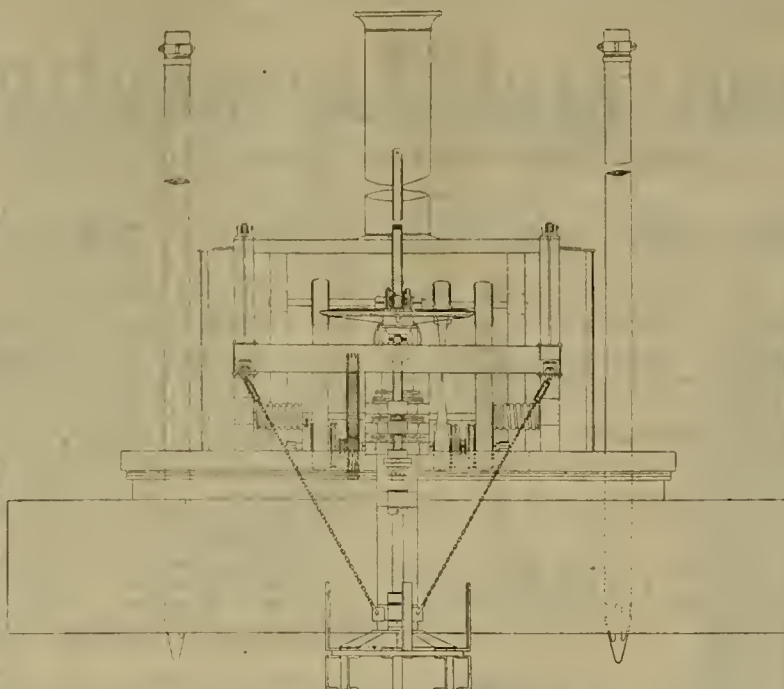
San Francisco, Cal., Oct. 29, 1891.

Mining Dredges in Victoria, Australia.

The principle of working river beds and shallow alluvial flats by means of dredging has been subjected to a series of practical tests in the Owens district, Beechworth District, Victoria, Australia. The Woolshed Valley G. M. Co., with machinery in an experimental stage, believe that more dirt can be operated upon than by any system hitherto practiced for working such ground. They have an engine, and modification of the centrifugal sand-pump, lifting the earth, sand, etc., 49 feet. This machinery is on a barge 45x35 feet. The engine and machinery cost £4000 and the barge £1500. In order to secure the ground to be worked from floods, it was necessary to construct a dam and flood-race. The latter is over 500 yards long by 40 feet wide, and encloses about 12 acres of the bed of the creek.

The depth of the ground will be from 25 to 30 feet. The wash dirt is raised by the pump 49 feet, and falls into two sluices, each 200 feet long by four feet wide, where it is operated upon in the usual method of sluicing.

The ground selected for present working is near the richest claim that was on the Woolshed, and it is thought that the careless methods of early days—1856—have left behind enough gold and tin to make most profitable the whole of the creek worked by this new process. Other similar plants, are to be put



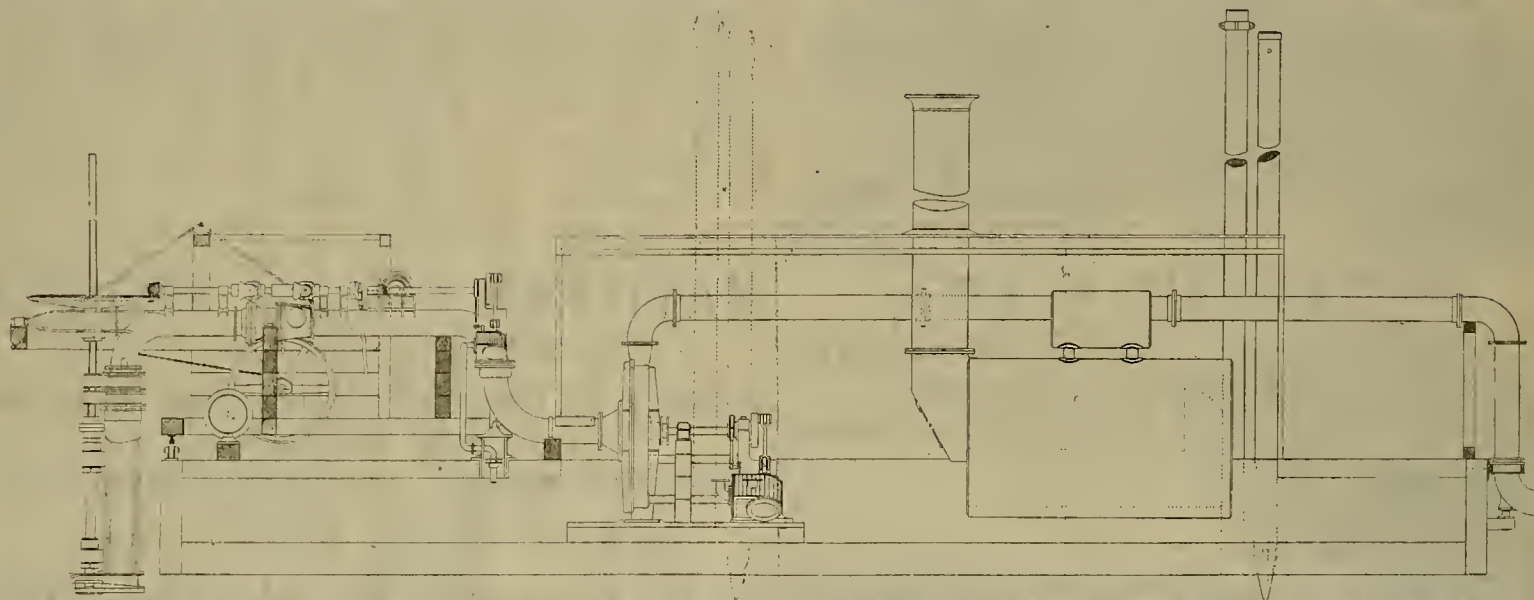
SECTIONAL VIEW OF DREDGE, SHOWING PLOWS.

for mining, though the official report referred to, speaks of it as being used with good results for dredging gold-bearing deposits in beds of rivers in Australia. The general subject of river dredging for gold is referred to in another article in this number of the Press.

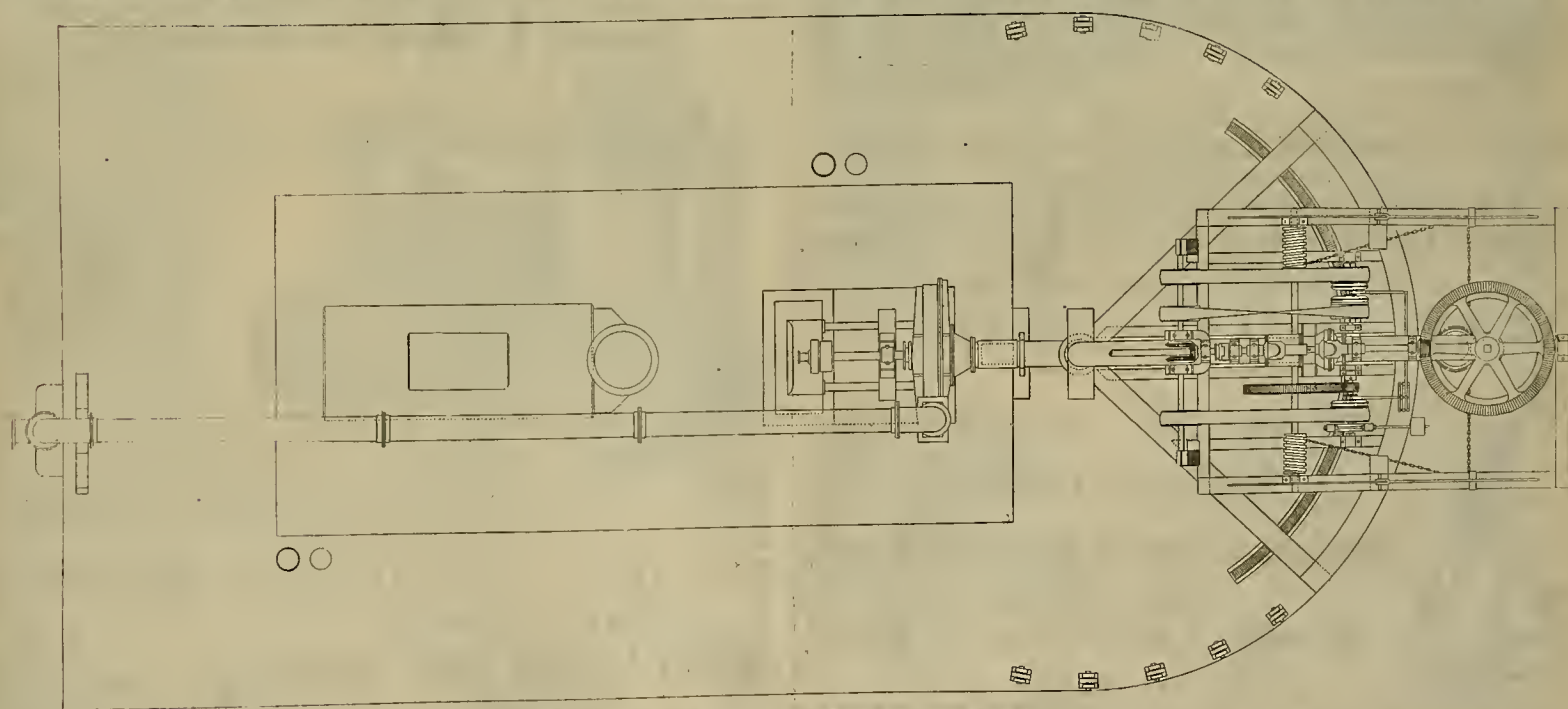
VALUABLE SLIMES.—On Nov. 3, a notice was served on the Hale and Norcross, Savage, and Chollar mining companies, instructing them to take possession of the slimes impounded in reservoirs, and claimed by the mill rings of the Comstock. Refusal or neglect to comply with this notice will compel the stockholder (M. W. Fox) to institute an action in behalf of the corporation for the recovery of all these valuable alluvies, assaying from \$50 to \$150 per ton.

THE NEW ARTIFICIAL QUININE, produced by Messrs. Grimaux and Armand of Paris, is mentioned as one of the great discoveries of the year. It is obtained by treating the base anprein of a Brazilian shrub with sodium, then treating the resulting compound with chloride of methyl. The product is quinine absolutely identical with the substance that has become so familiar and so indispensable.

At the Crescent mine, near Greenville, Plumas Co., ten shots had been put in by two Italian miners, when they gave the signal to hoist them on the bucket. When about 10 feet up, three blasts went off and one man fell to the



SMALL VON SCHMIDT PATENT SUCTION DREDGE, FOR DREDGING GOLD-BEARING DEPOSITS IN BEDS OF RIVERS, ON BEACHES, ETC.



PLAN OF DREDGING MACHINERY ON BARGE.

up if this proves unsuccessful. They expect to lift and wash a cubic yard a minute for 3d, whereas the same quantity handled by manual labor in the old way cost 1s 6d.

Similar machinery (Von Schmidt's patent) is being used with good results at Yackandandah,

and plans of this are given in the accompanying cuts. These cuts, and these remarks, are taken from the last official report of the Secretary of Mines for Victoria. The Von Schmidt suction dredge is a California patent, and has been for years working in Oakland harbor and

other places dredging mud and depositing it at a distance. The revolving plow cuts away the mud, which is sucked up with quantities of water by the suction pump, and thence passed through a long pipe to point of deposit. It has not to our knowledge been used in this State

ground. After he reached bottom, the other seven shots went off, yet he was not killed, though badly hurt.

SOME ore containing a little silver and a trace of gold has been struck near New Almaden.

WM. H. TAYLOR, President.

R. S. MOORE, Superintendent.

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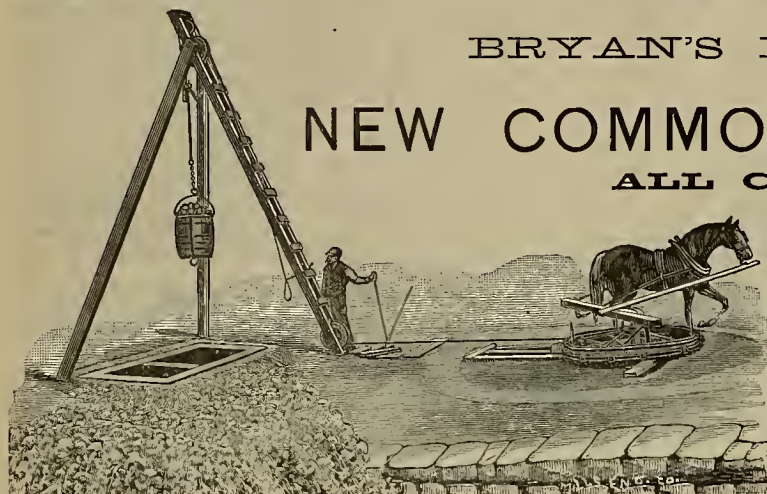
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NEW COMMON SENSE STEEL WHIM.

ALL COMPLETE FOR \$150.



NO COG WHEELS OR CLUTCHES TO BREAK. Ninety per cent of this whim is wrought iron and steel, and will spring or bend before breaking, and besides can be repaired at any blacksmith shop, should breakage occur, thus obviating the necessity of sending away hundreds of miles sometimes, and waiting a week for repairs. THE BRAKE SETS ITSELF WHEN THE HORSE STOPS OR ANYTHING GIVES WAY.

It can be packed anywhere a jack can go, the heaviest piece weighing but 100 pounds; total weight, 650 pounds. The sweep can be thrown out or in gear at any time, and the bucket hoisted, dumped or lowered while the horse is in motion. It is just as safe and reliable as an engine, and can be handled as readily, and is just the thing to open up a mine and make it pay. Spending thousands of dollars in fine machinery and shaft houses has "busted" many a company. Buy a COMMON SENSE WHIM, and when you have got more ore than our Whim will hoist, then it is time to buy an engine, not before. It will save you thousands of dollars if your mine should not pay. Being all iron except the sweep, it will not rot, warp, twist, or get out of true. Being wrought iron, it will not break in transportation.

We also make TWO, FOUR AND EIGHT-HORSE POWER WHIMS, DERRICK WHIMS, and BUILDING HOISTS, ORE BUCKETS, and everything pertaining to Horse Power Hoisting. State for what purpose, and at what place you want to use it.

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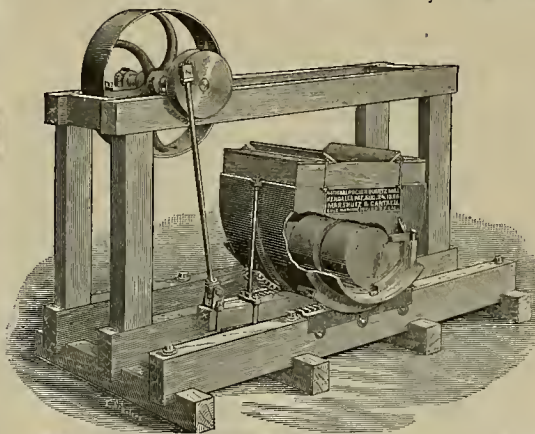
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Elevator, 12 Front.

Secretary Foster on Silver.

On Wednesday, November 11th, the American Bankers' Association, representing a membership of 1993, met at New Orleans, at which a letter was read from Hon. Chas. Foster, Secretary of the Treasury, on the present status of the silver situation in this country. In his letter the Secretary states that the amount of silver bullion purchased with treasury notes, under the provisions of the new law, from August 13, 1890, to November 1, 1891, has aggregated 66,588,536 fine ounces, costing \$68,626,585, an average cost of \$1.03 per fine ounce. From this silver \$27,848,475 has been coined, and the remainder is stored, in the shape of fine bars, in the vaults of the Mints as a reserve against the treasury notes outstanding. The Secretary, while claiming that the amount of money in circulation is greater per capita than in any other country except France, yet with the growing requirements of this country we can readily absorb the money put out through the annual monthly purchases of silver.

Toward the close of his letter, Secretary Foster says:

It is claimed by those conversant with the production and movement of silver that when the visible stock upon our market is disposed of, the monthly absorption of 4,500,000 ounces of silver by this Government will have a tendency to effectually and permanently steady the price of that metal. If the monetization of silver as full legal tender is ever to be accomplished, it can only be done by the action of nations of sufficient commercial importance to maintain some fixed ratio in the coinage between the two metals. The new Silver Act is an important step in that direction—(1) because compulsory coinage and the issue of silver dollars of less intrinsic value than their nominal value, is repealed; (2) because it provides for a much larger absorption of silver by this country than heretofore, for currency purposes, and (3) because the new law declares it an established policy of the United States to maintain the two metals at a parity with each other.

How Much Longer.—The smelting plant is a success. It is no longer theoretical only; it is practical. All day long and all night the rock and coal are going down into the fire and streams of red-hot slag and metal run into the receptacles that await them. During each period of 24 hours a hundred tons of ore go into the furnace mouth; and during the same period, 15 tons of silver-lead bullion run into the lead wells. One large enterprise is already on a paying basis, notwithstanding the lack of railways to connect us with the world. How much longer can the haterings and hickerings and jibes of railway men prevent the whole of Southern Nevada from being awakened into life? When competing railways, or a single line that will give us decent rates, connect us with tide water, a hundred such enterprises as that which has just struggled into a successful position, will spring into existence. The steam whistles of hoisting and reduction works will resound in every range of hills. Thousands of acres will be tilled to hundreds that are now in use, and a hundred thousand prosperous people will inhabit a wonderfully wealthy land now almost unknown. —*Pioche (Nev.) Record.*

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. O. BAILY—San Francisco.
OEO. WILSON—Sacramento Cal.
J. H. CROSSMAN—Perris, Cal.
CHAUNCEY A. DAYTON—San Lucas, Cal.
O. R. OIL—Cambria, Cal.
WM. T. HALL—Cloverdale.
MRS. GRANT—Duckworth—Fillmore, Cal.
ROBERT H. ABER—El Cajon, Cal.
F. K. MEKITT—Healdsburg.
FRANK A. SWETTER—Solano Co.
W. E. BRAYTON—San Benito Co.
J. T. AUSTIN—Tulare County.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

LARGE ORDER FOR TURBINES.—One firm recently ordered 18 large water-wheels of James Leffel & Co., Springfield, Ohio, builders of the famous James Leffel wheel. A large wood pulp mill, now under construction in Wisconsin, will use these wheels. This new enterprise is situated near large quantities of suitable timber and where ample water power can be obtained.

GOOD NEWS FOR THE BLIND!

TREATS SUCCESSFULLY ALL DISEASES OF THE EYE without operation. Residence and Office, 1432 Geary St., corner Laguna, San Francisco.

Assessment Notices.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 4th day of November, 1891, an assessment (No. 1) of One (1) Cent per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, 303 Pine Street, San Francisco, California. Any Stock upon which this assessment shall remain unpaid on the seventh (7th) day of December, 1891, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the twenty-eighth (28th) day of December, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
W. J. GURNETT, Secretary.
Office, 303 Pine Street, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 27th day of October, 1891, an assessment, No. 26, of Four (4) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of November, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 21st day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

DELINQUENT SALE NOTICE.

NEW EL DORADO GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.

Notice.—There are delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 2d day of October, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No.	No.	Cert.	Sh. res.	Amt.
J. L. Wilbert.....	94	5			\$ 25
J. L. Wilbert.....	99	5			25
J. L. Wilbert.....	100	5			25
J. L. Wilbert.....	101	25			1 25
J. L. Wilbert.....	102	25			1 25
J. L. Wilbert.....	106	15			75
W. N. Martin.....	118	100			5 00
W. N. Martin.....	119	100			5 00
W. N. Martin.....	146	800			40 00
W. N. Martin, Trustee.....	154	1,000			50 00

And in accordance with law, and an order from the Board of Directors, made on the 2d day of October, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California, on FRIDAY, the 27th day of November, 1891, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

DELINQUENT NOTICE.

CALIFORNIA AND ARIZONA MINING COMPANY.—Location of principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment, No. 4, levied on the 29th day of September, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No.	No.	Cert.	Shares.	Amt.
William Wiggins.....	87	3,750			\$375 00
Martin Corcoran.....	61	1,250			125 00

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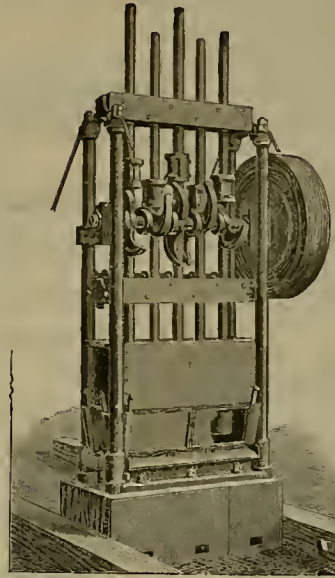
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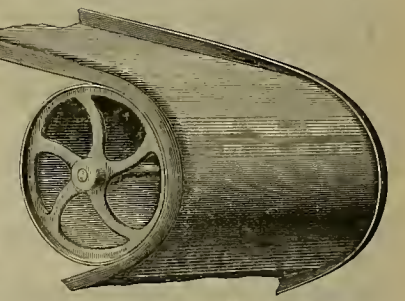
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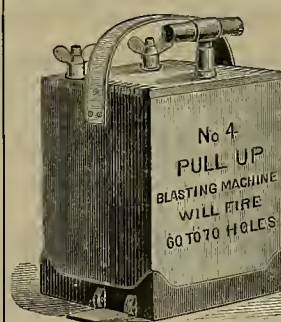
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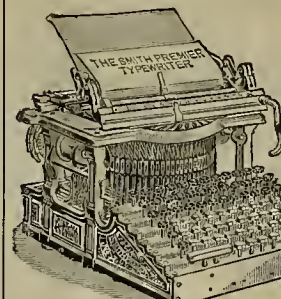
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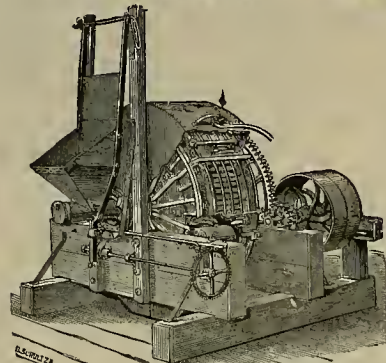
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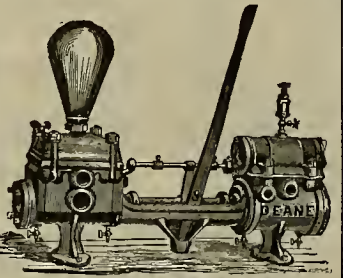
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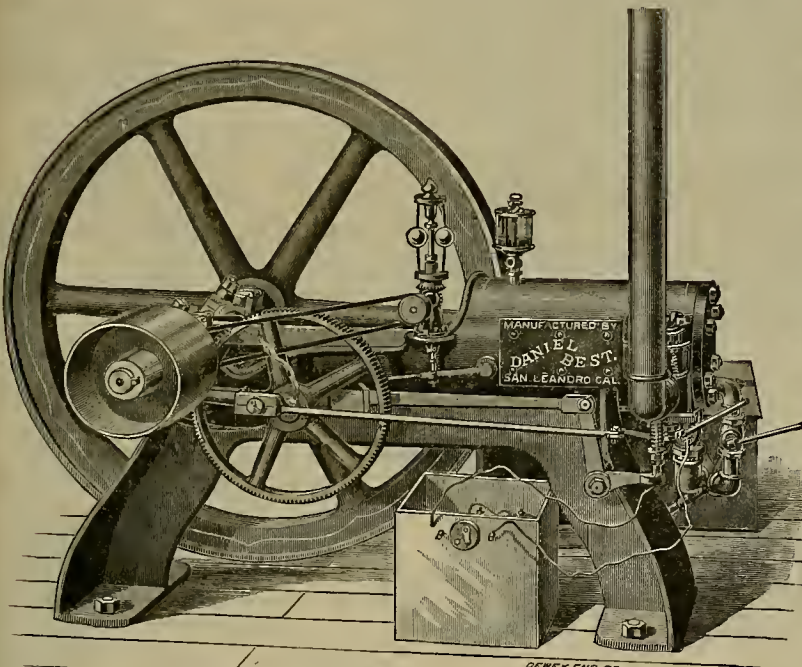
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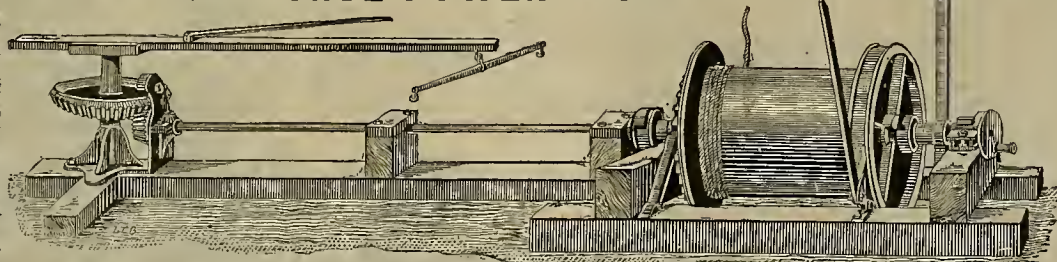
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 12, 1891.
General trade continues fairly active, although in some branches it is reported dull. The money market is fairly active, with the commercial banks reporting a good inquiry for funds. The savings banks report large holdings. Interior advices continue to report money fairly easy, with, in some localities, holders seeking investment. The Eastern money centers report many generally active, with a fair degree of ease reported. The importation of gold from abroad aids in the general ease. European mail advices indicate a growing stringency in the money centers, owing to the outward flow of gold. The Russian loan and the heavy importation of cereals are the two prime factors in creating the stringency.

In remarking on the money situation East, a correspondent writes as follows: "The conditions are all favorable. The crops are large and safe; they are bringing good prices, with a demand beyond the most sanguine expectations. The only mistake appears to have been in expecting to find the money in circulation too quickly. The trust and loan companies are beginning to get a good deal of their money back, but it has not had time to be reinvested. The railroads are earning a great deal more money than in previous years, but their floating debts are larger, and before they can spare anything for equipments and renewals, old scores have to be settled, and so on all the way through. In some parts of the country, a good deal of liquidation has been going on among mercantile and manufacturing establishments, so that the period for expansion has barely been felt as yet. Business is in a perfectly healthy condition, nevertheless, and while there is nothing to indicate much, if any, improvement this year, it will probably develop very rapidly during 1892."

MEXICAN DOLLARS—The market continues easy at around 74 1/2 cts. One large institution holds considerable cash cost over 76 cts.

QUICKSILVER—Receipts the past week aggregate 342 flasks. With the different mines' output pooled, quotations are more stable. The demand is fair.

SILVER—The market continues to fluctuate. It is very difficult to get at the bottom of the present situation both at home and abroad, but it looks as if there is a strong under-current to place the metal in all civilized countries on a more even footing with gold. The growing scarcity of the latter metal and the increasing requirements for commercial purposes are likely to force silver to the front.

IRON—Imports the past week aggregate as follows: Sutherland, 600 tons; Hull, 100; Liverpool, 300. Total, 1000 tons. The market is reported fairly firm at quoted rates. The imports of the week are said to have been provided for previous to receipt. The consumption is quite large and steadily increasing. Eastern mail advices continue to note low prices, with Southern furnaces supplying the bulk. It is generally conceded that prices cannot go any lower, and with any increase in the demand, better prices will obtain. English advices report a steady market.

COPPER—The market appears for the present, at least, to have touched bottom. New York mail advices to Nov. 5th, report as follows: "That consumers are inclined to purchase with greater freedom is not clear and the condition of the market for manufactured goods is not wholly assuring for any decided improvement in the immediate future. Shipments to Europe are still on a liberal scale, but new orders are unimportant, and no great relief is likely to come from that quarter. There has been some inquiry suggestive of speculative interest, but the latter appears to be confined within the metal trade proper and apparently engineered for effect. Offers were said to have been made of 1 1/4 cts on upward of 1,000,000 pounds of Lake Superior iron for delivery this year and 1 1/2 cts on smaller quantities." London cables to *Iron Age* of Nov. 5th, are essentially unchanged from those given in our last week's issue.

TIN—The local market is lifeless for both plate and bars, with quotations more or less nominal. Eastern and European advices report an unsettled market, with buyers favored, owing to larger available supplies.

LEAD—The market is barely steady at quotations. The St. Louis market is reported in a demoralized condition, and while prices are lower, yet there are those who look for a still lower range.

COKE—Imports the past week are as follows: London, 2000 tons; Swansea, 90; Sutherland, 340; Hull, 199. Total, 4420 tons. The market is well supplied and quotations barely sustained.

BORAX—Receipts the past week aggregate 420 casks. The market is strong at pool prices.

ANTIMONY—The market is firm. Eastern advices report supplies at home and abroad well under control.

COAL—Imports the past week are as follows: Greenock, 3235 tons; Departure Bay, 7130; Hull, 1089; Coos Bay, 470; Tacoma, 6000; Swansea, 4687; Seattle, 957; Liverpool, 1798; Newcastle, N. S. W., 18,685; Comox, 4500; total, 60,826 tons. The above are the largest imports within any one week for several months past. The spot market is oversupplied, with buyers favored. The scarcity of yard room is against both spot and near by cargoes. The consumption, although large is not up to expectation, owing to the absence of cold weather, and consequently, a light demand for household purposes. Cargoes for shipment are strong, owing to the firm views of ships from supply ports.

Eastern Metal Markets.

By Telegraph.

New York, November 11.—The following are the closing prices the past week:

	Silver in	Silver in	Copper.	Lead.	Tin.
Thursday	43 1/2	94 1/2	11 50	4 10	19 90
Friday	43 1/2	94 1/2	11 40	4 10	19 80
Saturday	43 1/2	94 1/2	11 40	4 10	19 80
Sunday	43 1/2	94 1/2	11 40	4 10	19 80
Monday	43 13 1/2	95 1/2	11 35	4 10	19 65
Tuesday	43 1/2	95 1/2	11 35	4 10	19 75
Wednesday	43 13 1/2	94 1/2	11 35	4 10	19 80

Quicksilver is strong at full figures. Iron is in good demand. Borax is steady at pool prices. Tin is barely steady. Lead is weak and unsettled. Copper is steady at lower quotations.

Mining Share Market.

The mining share market showed considerable activity the past week and at better prices. While many of the reported sales were unquestionably cross-orders, yet there were a fair percentage of genuine transactions. The principal advance was in the shares of the Gold Hill, Devil Gate and Middle group of mines. Quotations through cross-orders for the shares had been brought down to about as low figures as they usually touch, even when the mines did not show so well. The managements have been prospecting to the west on several levels, and reliable advices confirm the finding of rich ore, and to get more stock was undertaken by breaking the market through cross-orders and assessments. Their endeavors, to a large extent, were crowned with success. It was their purpose to sink quotations to still lower figures, so as to get still more shares, and which they would have done had it not been for the course of this paper in publishing the true situation of the stock market, the condition of the mines and the purpose of the pool. Outsiders must not forget that in operating in stocks they are playing against great odds and that a good profit in sight is like a bird in hand, worth two behind the bush. While there has been a good advance in the market, some of the stocks nearly doubling in value, yet it looks as if still better prices will obtain, but how much, each person must be the judge. If prices run up to figures beyond what the situation at the mines warrants, then it is safe to say that the shares are a sell, for when top prices are reached another strong depression, with low prices, to be followed by assessments, will set in. At this writing there is nothing to warrant the conclusion that top prices have been reached, but everything to justify the assertion that many of the stocks have hardly commenced an upward move.

In outside shares, there has been more activity in Bodie, but the Quijotas and Tuscaroras have hung lifeless.

The Chollar, Savage, and Hale and Norcross Mining Companies have been notified by a stockholder (M. W. Fox) to take possession of the slimes, etc., for the benefit of shareholders. If this notification be ignored, then measures will be taken to see that it be done. As the slimes, etc., assay from \$50 to \$150 per ton, and there are thousands of tons, it will be quite a nest-egg for shareholders.

It now looks as if the days of the mill rings on the Comstock lode are numbered, and when they become a part of the past, then we can look for a real, genuine stock deal in mining shares, with outside capital invested. It is the general opinion that the rings getting away with the bullion, while outside shareholders get left with assessments on their hands, has killed the goose which laid the golden egg. Even after a reformation starts in, it will probably be some time before outside capitalists enter the market.

It is thought that it would serve the rings right, now that they have many of the mines in good condition for looting, if they could be compelled to work them honestly and for the benefit of shareholders, and not for a limited few boddlers, so that dividends, and not assessments, be in order.

According to the reports of the superintendent of the Hale & Norcross Company, the ore taken out of the mine for the years 1888 and 1889 and the first half of 1890 assayed in value about \$3,500,000, which, had they milled in the same manner as was the ore in the bonanza days, would have yielded in bullion fully \$3,150,000, which would have paid many dividends; but instead, only one dividend (\$108,000) was paid, while several assessments were collected.

On next Monday, the suit of M. W. Fox vs Hale and Norcross Mining Co. (an incorporation) and the different directors who have served, continuously or otherwise, since 1886 will come up for trial before Judge Hebbard, and if the defendants do not succeed in securing another postponement, it will be tried to a finish. It is openly asserted that this suit will show stockholders how the mine has been looted. It is said that full details will be given, from the electing of dummy directors by aid of proxies given by brokers who do not own the stock they vote, until the ore is handed over to the mill ring. Evidence, it is claimed, will also be given, systematically trading the bullion to the assay office, from thence to the United States Mint, and the proceeds into the treasury of the company and into the pockets of the mill ring. If the plaintiff proves what he says he can, then stockholders will be able to see that they always get crow while the mill ring gets turkey.

Mining shares opened this (Thursday) morning generally weak. After regular call, prices went off slightly, but toward the close a stronger tone was noted, but with no higher prices quoted. The general feeling is bearish, and the present move is only made to allow a large operator to get out of his stock and at the same time collect assessments.

News from the Comstock mines continues uniformly good. If the writer is not mistaken, the character of the work in several of the mines looks as if it will be several months before the pool can or will show up much ore on which to have a large-sized deal. The prospecting and developing work is being done on an unexampled large scale, and when the time does arrive to show ore, we can reasonably look for the best of results, provided the mines are worked according to the mining laws of California. While the work is under way active times are not at all improbable, and higher prices reached for shares; yet while saying this, it is not at all unlikely but lower prices will be touched before the big deal sets in. Many well-informed operators take this view, and heretofore they have been right. They reason that an upward move before a holiday means lower prices afterward, but a weak, dragging market before a holiday means higher prices afterward. But then this rule may not be infallible. In Mexico they are sinking a compartment shaft. It is claimed that it is sunk so as to intercept the 1800-foot Con. Virginia north drift so as to get air and admit of more thorough developing work in Con. Virginia, Ophir and Mexican. In sinking the shaft, they are liable to strike ore of more or less width and of more or less value, which will admit of making a gambling move similar to what was done in sinking the winze in Overman and again in Potosi. They ought to be in ore soon on the 1800-foot level in Con. Virginia. In the middle mines, active developing work is still the order. In the Gold Hill

MINING SHAREHOLDERS' DIRECTORY.

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COMPANY AND LOCATION.	NO. AC.	LEVIED, DELIN'T AND SALE.	SECRETARY.
Alta M Co, Nevada.....	49.....	Oct 6, Nov 11, Dec 2.....	L Osborn, 309 Montgomery
Alpha Cons M Co, Nevada.....	70.....	Nov 4, Dec 1, Dec 29.....	C E Elliott, 309 Montgomery
Best & Belcher M Co, Nevada.....	13.....	Sept 22, Nov 4, Dec 9.....	H D Walker, 309 Montgomery
Bodie Cons M Co, California.....	16.....	Oct 2, Nov 9, Nov 26.....	J P Sullivan, 121 Post
Buchanan M Co, California.....	16.....	Oct 2, Nov 9, Nov 26.....	J P Sullivan, 121 Post
Bulwer Cons M Co, California.....	7.....	Oct 2, Dec 4, Dec 31.....	L Osborn, 309 Montgomery
Butte King M Co, California.....	2.....	Sept 21, Oct 31, Nov 18.....	W C Lewis, 723 Market
California & Arizona M Co, California.....	4.....	Sept 21, Nov 9, Nov 30.....	T E Jewell, 310 Pine
California Verde Marble Co, California.....	1.....	Nov 4, Dec 7, Dec 23.....	W J Burnett, 308 Pine
Chollar M Co, Nevada.....	31.....	Oct 26, Nov 30, Dec 22.....	C E Elliott, 309 Montgomery
Cons Imperial M Co, Nevada.....	32.....	Nov 2, Dec 8, Dec 29.....	U L McCoy, 331 Pine
Cons New York M Co, Nevada.....	8.....	Sept 28, Nov 2, Nov 24.....	C E Elliott, 309 Montgomery
Del Monte M Co, Nevada.....	5.....	Sept 28, Nov 3, Nov 30.....	J P Sullivan, 121 Post
Eureka Cons Drift M Co, California.....	4.....	Oct 2, Nov 26, Nov 30, Dec 21.....	D M Kent, 330 Pine
East & Belcher Silver M Co, Nevada.....	7.....	Oct 22, Nov 24, Dec 12.....	C H Mason, 331 Montgomery
Fall River Cons Gold Quartz M Co, California.....	6.....	Oct 20, Nov 26, Dec 21.....	L Cassel, 115 Front
Fenaville Gold M Co, California.....	2.....	Oct 18, Nov 23, Dec 21.....	L N Thorne, 309 Montgomery
Gray Eagle M Co, California.....	8.....	Oct 27, Nov 24, Dec 12.....	E W Holmes, 309 Montgomery
Hale & Norcross S M Co, Nevada.....	93.....	Oct 16, Nov 2, Dec 15.....	A B Thompson, 309 Montgomery
Horse Shoe Bar Cons M Co, California.....	3.....	Oct 30, Dec 1, Dec 22.....	D M Kent, 330 Pine
Kentuck Cons M Co, Nevada.....	2.....	Oct 26, Dec 1, Dec 23.....	J W Pew, 310 Pine
Keystone Cons M Co, California.....	1.....	Sept 15, Oct 21, Nov 25.....	J H Ibban, 310 Pine
Kingman Cons Co, Arizona.....	1.....	Sept 30, Oct 12, Dec 1.....	T E Aikman, 42 Montgomery
Mono G M Co, California.....	31.....	Sept 17, Oct 27, Nov 30.....	H D Walker, 309 Montgomery
New El Dorado M Co, California.....	3.....	Oct 2, Nov 6, Nov 27.....	J W Pew, 310 Pine
Ophir M Co, Nevada.....	8.....	Oct 18, Nov 23, Dec 16.....	E B Holmes, 309 Montgomery
Overman M Co, Nevada.....	62.....	Sept 26, Oct 30, Nov 20.....	G D Durward, 414 California
Peer M Co, Arizona.....	1.....	Nov 5, Dec 8, Dec 23.....	N T Messer, 309 Montgomery
Peerless M Co, Arizona.....	17.....	Sept 17, Oct 21, Nov 19.....	A Waterman, 309 Montgomery
Pennsylvania Gold M Co, California.....	10.....	Oct 18, Nov 23, Dec 16.....	E W Holmes, 309 Montgomery
Savage M Co, Nevada.....	77.....	Nov 5, Dec 8, Dec 23.....	E B Holmes, 309 Montgomery
Seg Belcher & Mides Cons M Co, Nevada.....	9.....	Oct 29, Dec 1, Dec 21.....	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nevada.....	100.....	Oct 5, Nov 11, Dec 1.....	E S Parker, 309 Montgomery
Silverado M Co, California.....	2.....	Oct 13, Nov 16, Dec 17.....	S E Cox, Chronicle Building
St. Louis Cons M Co, California.....	1.....	Oct 2, Nov 24, Dec 18.....	E B Holmes, 309 Montgomery
Utah Cons M Co, Nevada.....	13.....	Oct 16, Nov 24, Dec 18.....	A H Fish, 309 Montgomery

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
California Verde Marble Co, California.....	Annual.....	W J Burnett, 308 Pine.....	Nov 16
Challenge Cons M Co, Nevada.....	Annual.....	O L McCoy, 331 Pine.....	Nov 16
E Best & Belcher Silver M Co.....	Annual.....	O H Mason, 331 Montgomery.....	Nov 23
Hamburg M Co.....	Annual.....	J N Pike, 331 Montgomery.....	Nov 17
Mortimer M Co.....	Annual.....	N Pike, 331 Montgomery.....	Nov 17
N Nevada Cons M Co, Nevada.....	Annual.....	C H Mason, 331 Montgomery.....	Nov 30
Ophir Cons M Co, Nevada.....	Annual.....	A K Durward, 309 Montgomery.....	Nov 16
Puguet Sound Iron Co.....	Annual.....	A Halsey, 309 Montgomery.....	Nov 17
Summit Gold M Co.....	Annual.....	H D Walker, 309 Montgomery.....	Nov 16

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Champion M Co.....	10.....	T Wetzel, 320 Sansome.....	Aug 15
Cons Cal & Virginia M Co, Nevada.....	50.....	A W Havens, 309 Montgomery.....	Aug 17
Copits M Co.....	30.....	E M Hall, 314 Montgomery.....	Sept 10
Great Western Quicksilver M Co.....	25.....	A Halsey, 328 Montgomery.....	Oct 1
Idaho M Co, Gravel Valley.....	3.....	Gravel Valley.....	Aug 4
Mayflower Gravel M Co, California.....	30.....	M Kent, 330 Pine.....	Aug 20
Pacific Coast Borax Co, California.....	100.....	A H Clough, 230 Montgomery.....	Nov 10
Standard Cons M Co, California.....	10.....	J W Pew, 310 Pine.....	Oct 26

group they will soon be able (about January) to commence active work to develop the ore below what is known as the water level. More active work is under way in the Alta group.

From the outside mines our advices report more men put on in the Quijotas mines, and that they will start up soon. In Silver King, active developing work is under way and ore is being taken out for milling. The Tuscarora mines continue to look well. They are shipping ore to Salt Lake for reduction. From the Bodies, encouraging news continues to come to hand.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING OCT. 22.	WEEK ENDING OCT. 29.	WEEK ENDING NOV. 5.	WEEK ENDING NOV. 12.
Alta.....	45	50	40	35
Alpha.....	40	35	25	30
Andes.....	75	80	70	85
Belcher.....	1.25	1.50	1.25	1.50
Belle Isle.....	50	40	45	55
Best & Belcher.....	2.35	2.85	2.40	2.85
Bullion.....	1.25	1.40	1.35	1.50
Bulwer.....	35	45	35	45
Commonwealth.....	25	35	25	35
Cons. Va. & Cal.....	1.25	1.50	1.40	1.60
Challenge.....	1.10	1.30	1.10	1.30
Confidence.....	1.05	1.25	1.05	1.25
Cons. Imperial.....	3.00	3.50	2.00	2.50
Oon. Imperial.....	1.00	1.05	1.00	1.05
Ophir.....	35	40	35	40
Ophir Point.....	1.20	1.35	1.40	1.55
Crocker.....	1.05	1.25	1.05	1.25
Del Monte.....	15	15	15	15
Eureka Cons.....	45	50	45	50
Excelsior.....	45	50	45	50
Grand Prize.....	1.45	1.75	1.50	1.75
Gould & Curry.....	1.05	1.30	1.20	1.45
Hale & Norcross.....	1.05	1.30	1.20	1.45
Julia.....	10	15	10	15
Justice.....	40	45	40	45
Kentuck.....	20	25	20	25
Lady Wash.....	10	15	10	15
Mono.....	15	20	15	20
Mexican.....	2.05	2.45	2.15	2.55
Nevada.....	30	40	30	40
North Belle Isle.....	30	40	30	40
Nev. Queen.....	20	30	20	30
Occidental.....	50	65	50	65
Ophir.....	1.75	2.15	1.80	2.25
Overman.....	30	40	30	40
Potosi.....	1.80	2.30	1.85	2.35
Peerless.....	05	15	05	15
Peer.....	10	15	10	15
Savage.....	2.05	2.50	2.15	2.60
S. B. & M.....	50	65	50	65
Sierra Nevada.....	1.75	2.25	1.80	2.30
Silver Hill.....	10	15	10	15
Scorpion.....	20	25	20	25
Union Cons.....	1.35	1.70	1.40	1.80
Utah.....	40	50	40	50
Yellow Jacket.....	1.50	1.70	1.55	1.80

* Assessment added.

San Francisco Metal and Coal Market.

THURSDAY, November 12, 1891.	
ANTIMONY.	STEEL.
Per lb..... 14 @	English, 16 @ 20
Refined, in car lots 8 @	Canton tool..... 9 @
Bowled, do..... 9 @	8 1/2" diam tool..... 9 @
Machine, do..... 7 @	Pick & Hammer..... 8 @
All grades jobbing at advance.	Machine..... 4 @
Toe Calk..... 4 @	
COPPER.	
Bolt..... 22 @	B. V. steel grade
Sheeting..... 22 @	14x20, spot..... 6 50 @
Ingot, jobbing..... 15 @	Charcoal, 14x20..... 7 @
Do, wholesale..... 14 @	Do roofing, 14x20 6 50 @
Bar, spot..... 22 @	Do do, 20x28..... 13 00 @
IRON.	
Fir, base..... 3 @	Pig tin, spot..... 21 @
Norway, base..... 4 @	Spot from yard—PER TON.
P. O. IRON.	
Eglington..... 25 @	Wellington..... 8 50
Gilgarnock..... 25 @	Gretta..... 8 00
Am. Soft, No. 1..... 25 @	Carbon Hill..... 8 00
Oregon Pig..... 30 @	Naiming..... 7 00
Puget Sound..... 30 @	Gilman..... 7 00
May Lake White..... 24 @	Seattle..... 7 00
Shotts, No. 12..... 25 @	Opos Bay..... 6 00
Langdon..... 25 @	Chatham..... 6 00
Thorncliffe..... 25 @	Egg bard..... 14 00
Garrabrie..... 25 @	Oumberland, in sacks..... 14 00
Carthage..... 25 @	Do, bulk..... 13 00
Crook..... 25 @	Wall..... 8 00
HEROME IRON ORE.	
Per ton..... 10 @	Scotch Splint..... 8 50
West Hartley..... 8 50	
LEAD.	
Bar..... 4 @	TR. LEAD—PER TON.
Sheet..... 4 @	Australian..... 7 12 @
Pipe..... 6 @	Liverpool..... 7 00 @
	Scotch Splint..... 7 00 @
	Cardiff..... 7 25 @
	Lehigh Lump..... 13 00 @
	Chamberland..... 10 00 @
	Egg, hard..... (at 00)
	West Hartley..... (at 75)
COKE.	
By the sack..... 43 @	English, to load..... 89 00 @
Fasks, oil..... 40 @	Do, spot, in bulk..... 12 00 @
	Do, in sacks..... 15 00 @

Sales at San Francisco Stock Exchange.

THURSDAY, November 12, 9:30 A. M.	
450 Alpha Cons.....	450 Julia.....
150 Andes.....	150 Justice.....
100 Belcher.....	100 Lady Washington.....
200 Belle Isle.....	150 Mexican.....
300 Best & Belcher.....	150 Occidental.....
100 Bodie.....	200 Ophir.....
350 Bullion.....	160 Overman.....
200 Bulwer Cons.....	1250 Peer.....
200 California.....	50 Potosi.....
200 Challenge.....	400 Savage.....
450 Chollar.....	100 Scorpion.....
100 Commonwealth.....	100 Seg Belcher.....
150 Cons Cal & Va.....	350 Sierra Nevada.....
50 Cons Imperial.....	100 Silver Hill.....
400 Crown Point.....	700 Union Cons.....
100 Excelsior.....	400 Utah.....
500 Gould & Curry.....	100 Yellow Jacket.....
300 Hale & Norcross.....	

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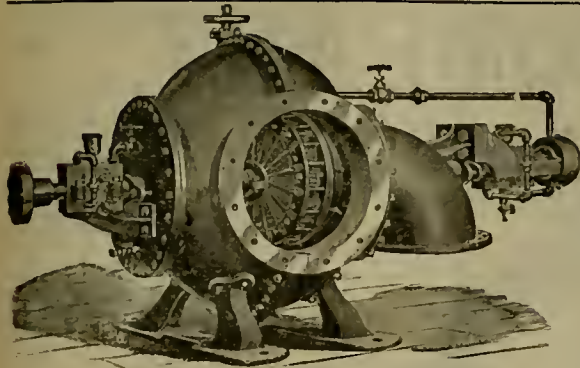
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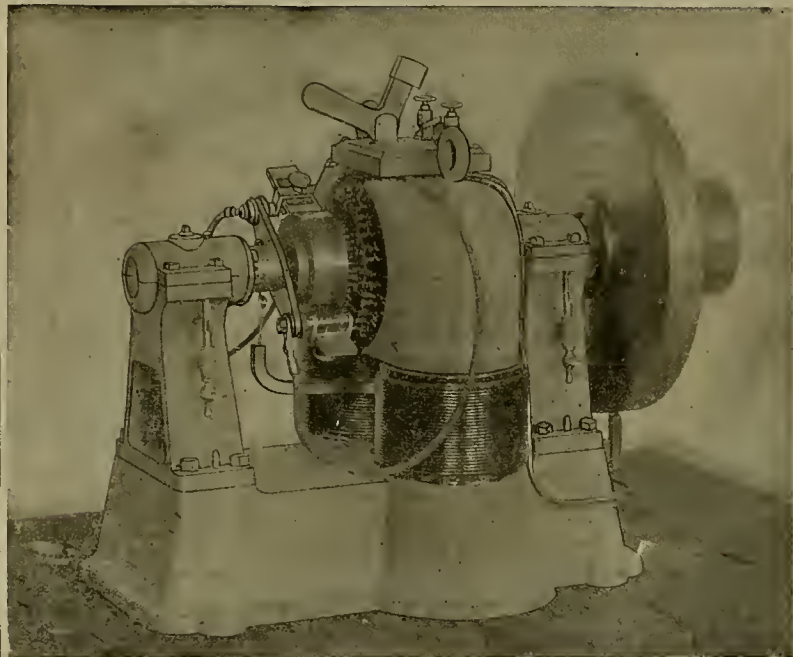
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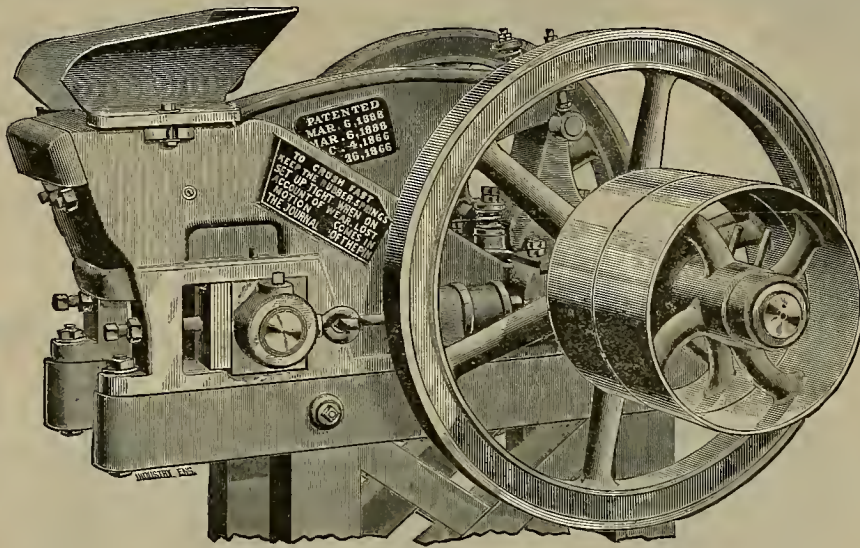
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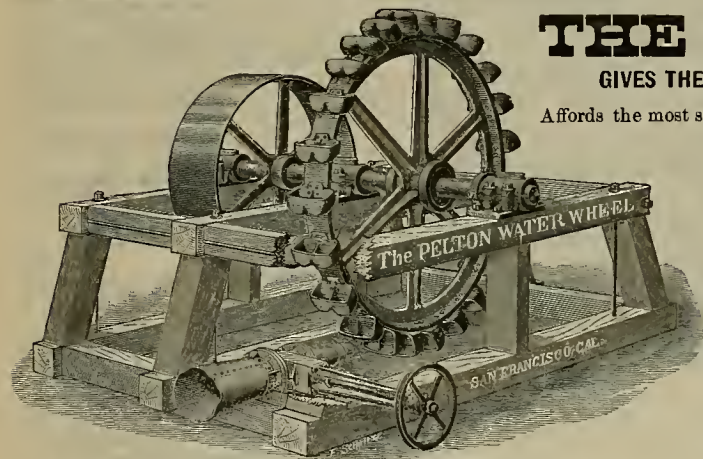
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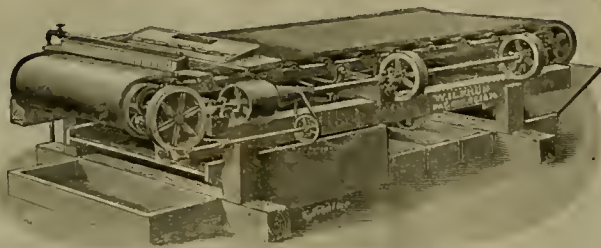
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For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



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September 18, 1883; July 24, 1888;

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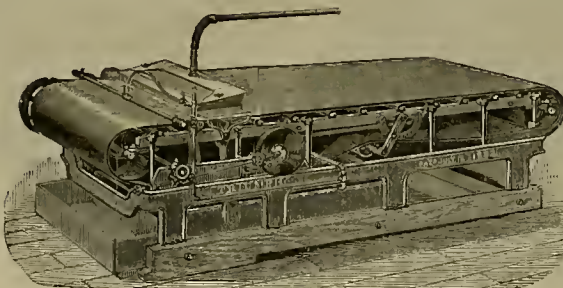
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Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.
GRASS VALLEY, NEVADA CO., CAL., NOV. 10, 1885.

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CERTIFICATE—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrator is the equal, if not superior to any other style of Vanners or concentrating devices.

Signed] Sup't North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.



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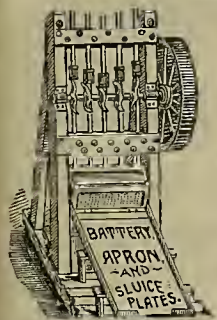
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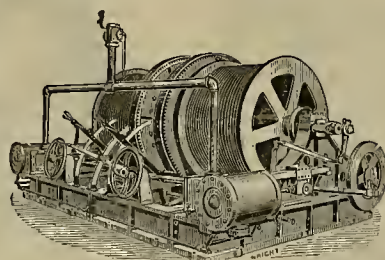
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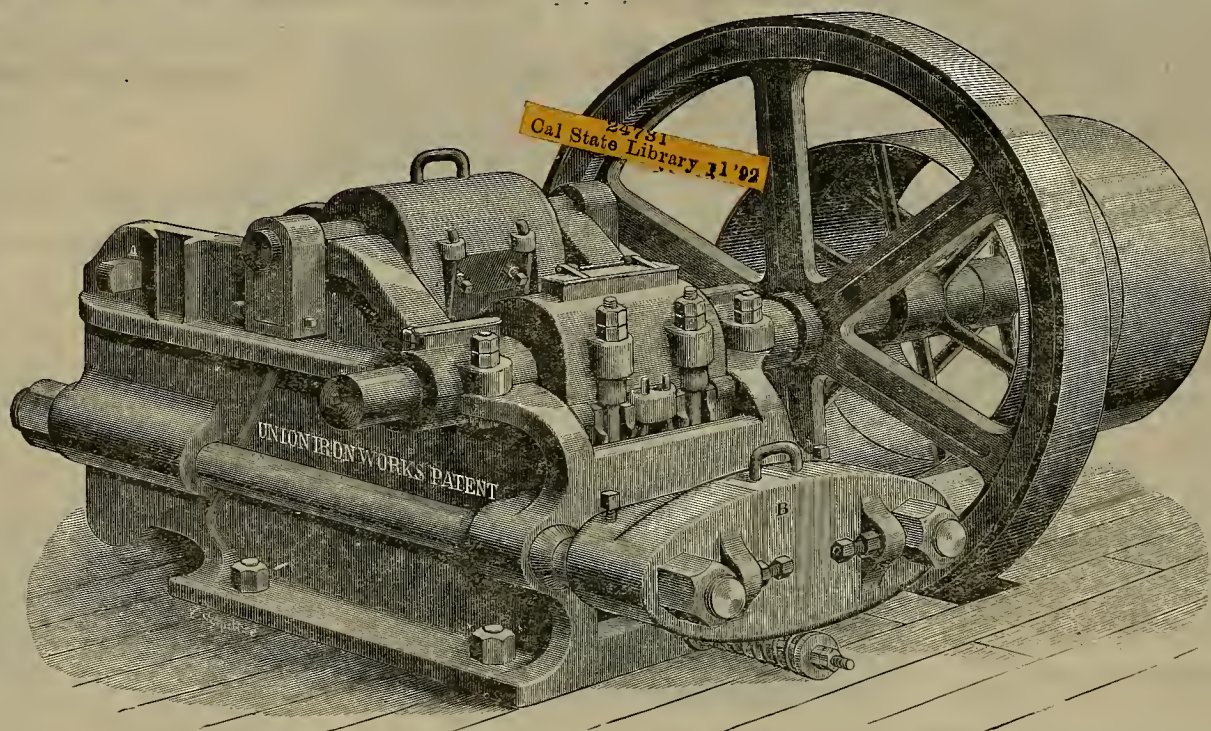
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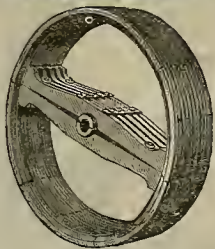
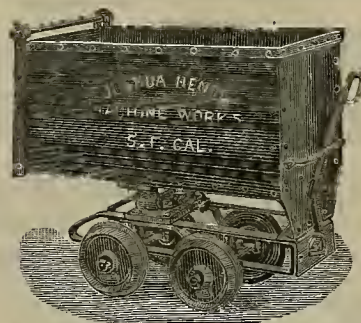
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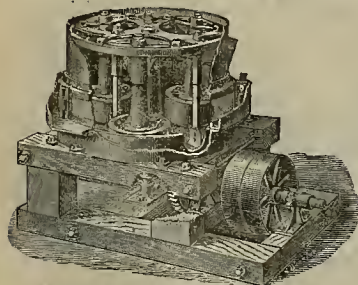
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Centrifugal Roller Quartz Mill.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 21.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 21, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Electric Locomotives.

While electricity had been used for some time in mining work, for the purpose of lighting mines, it attained no prominence in the field of underground haulage until the Thomson-Houston Electric Company designed and installed in the Erie Colliery of the Hillside Coal Co. the first successful electric mining locomotive of the country. This was in October, 1889.

Requirements of other mines, however, has led to the production of a locomotive differing essentially from that in the Erie Colliery, a type known as the "Terrapin Back," and which is shown in the accompanying illustration.

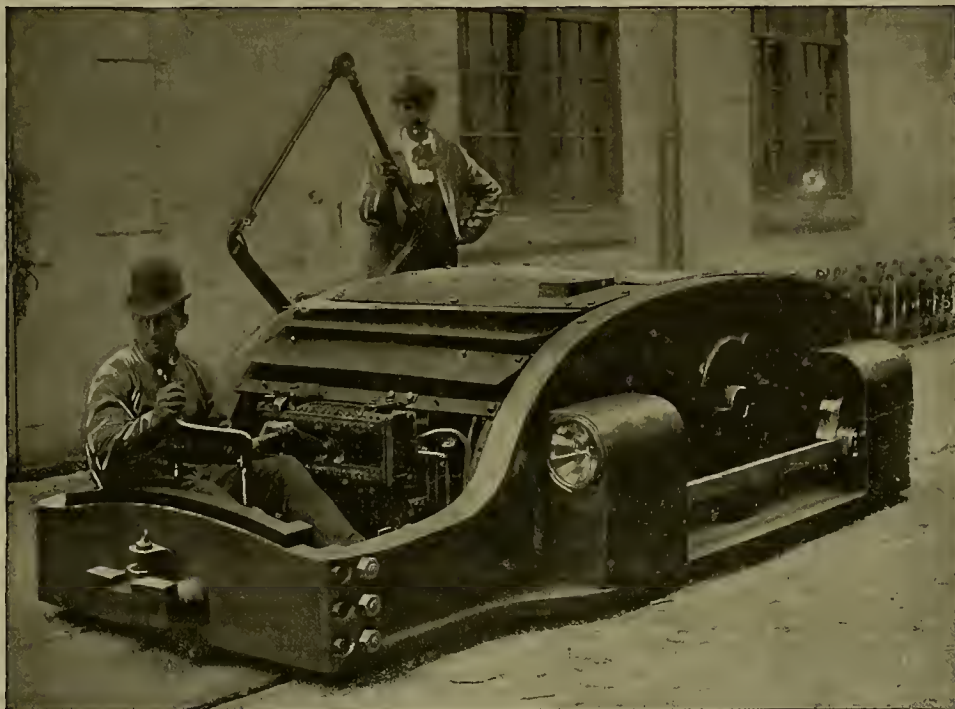
It is most substantially and solidly built, the interior mechanism being entirely protected by a heavy iron armor, and possesses in a marked degree the important features of strength and solidity. The motor for operating the locomotive is of the iron-clad consequent-pole type having a Gramme-ring armature.

It is provided with the radial type carbon brushes and elongated commutator segments, by means of which the most durable connection with the armature coils is obtained. The motor is situated midway between the axles, the proper speed reduction being attained by means of a train of gears. The locomotives can be run at various speeds, the motors being wound for any speed as a maximum from 4 to 10 miles an hour.

The locomotive is provided with the necessary controlling devices, all placed within easy reach of the operator.

A special type of rheostat, composed entirely of mica and German silver is employed, and a new and improved brake lever and reversing switch. The trolley arm, through which the current is conveyed to the motor is of the double-elbow pattern, which accommodates itself automatically to the varying heights of the conductor and permits the operation of the car in either direction. On each side of the locomotive is placed an incandescent lamp, which serves the double purpose of signal and headlight. A 220-volt generator supplies the necessary current.

The Thomson Van Depoele Electric Mining Co., which designed this locomotive, has also



THOMSON VAN DEPOELE ELECTRIC MINING COMPANY'S "TERRAPIN BACK" MINING LOCOMOTIVE.

in process of construction several new types suited to the requirements of different mines, hard and soft coal, iron and other metals, and for high and low entries and for gauges, varying from 18 inches to the standard. The company having had such valuable experience in the field of underground electric haulage, is particularly fitted to design and manufacture any locomotive of any type demanded by local conditions. The success of the apparatus already installed has given great impetus to this branch of applied electricity and will result in the still further use of electricity in mining operations.

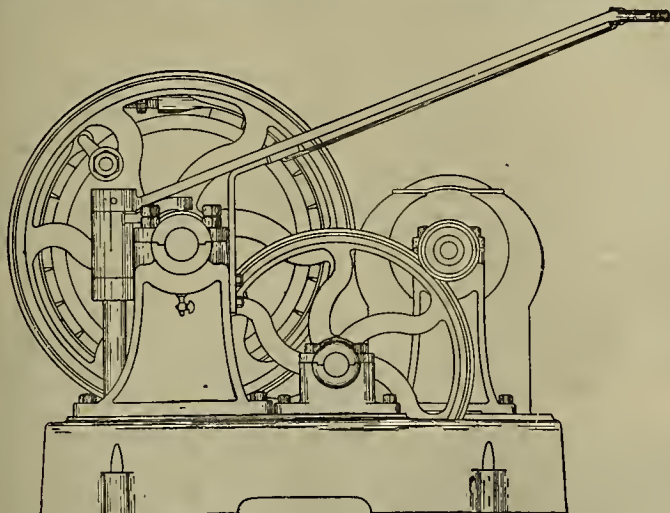
SOME Californians are talking of taking hold of the tin prospects at Dorango, Mexico.

Electric Hoists.

For hoisting purposes by electricity there is a variety of forms and sizes from a three-horse whip, for hoisting small buckets, to a machine capable of operating a full sized cage under its maximum load. Two cuts on this page (from Mr. Spaulding's paper on "Electric Power Transmission in Mining Operations") show different views of a line of electric hoists lately put upon the market for miscellaneous uses and ranging from 10 to 80 horse power.

THE WELLINGTON STRIKE OFF.—The news

from Nanaimo that the Wellington coal miners have, after a battle of 17 months' duration, declared their strike off was received with a great deal of satisfaction among the trade unionists in this city, who, although they would rather hear of victory than defeat, are glad the long and costly fight is over. The unions in this city have gone to much trouble and expense during the coal strike, and have given much assistance to the striking miners both by contributing money and by actively boycotting the fuel from the interdicted mines. The end of the trouble, therefore, is a great relief to them.



SIDE VIEW OF ELECTRIC HOIST.



AN ELECTRICAL MINING HOIST.

CORRESPONDENCE.

We admit, undorsed, opinions of correspondents.—Eds.

Mines About Kernville.

(Written for the Press by STEPHEN BARTON.)

Of the mines heretofore producing bullion in this locality most all are at a drag. The Russian Bear, at Glenn Olive, which one year ago, stood at the head, as a bullion producer, has been shut down and the machinery moved away, though I understand the principal owner has ordered a resurvey of the mine.

A couple of years ago a Los Angeles company hounded a new mine, south of here, called the Pine Tree. At the instance of this company, Mr. James Burton was induced to undertake certain development work, and at the expiration of the bond, found he had to look to a miner's and material man's lien for his pay. The matter went into court, and he ultimately received a sheriff's title. Some two months ago, he went to do the assessment work for the year, and erected a horse arrastra on the mine, where he has ample power for a Pelton wheel. He made a test run with a result of \$23 per ton. To say he was elated would be drawing it mild, as he has several hundred tons of rock mined on the chimney and in the slopes, of which this is regarded as a fair sample, and which can be reduced by arrastra process for \$7 per ton; besides, the lode has never been excelled for size by but two or three in this portion of the State.

The Finding of the Lost Ship Mine

Is creating some comment here. I think Capt. J. W. A. Wright was a correspondent of the Press, some 12 years ago, and wrote up the legends of the Ship mine, so far as could be ascertained. Ship was accustomed to bring to Visalia dust and fine specimens and claimed they were from a mine shown him by his faithful squaw. On one occasion he came to Visalia for the purpose, as is alleged, of making arrangements for a mill. As usual he got on a drunk, and as usual, undertook to resist arrest, while disturbing the peace. Next morning, Ship was hurried without any one but the squaw knowing the location of the mine. He lived north of Visalia, and many thought the mine was north of King's river. It is now claimed that the mine has been found on the desert, east of the Sierras, and if so, of course, his most feasible route would have been up King's river, and through the Kearsarge pass.

The story of the finding of the mine runs like this: After the death of Ship, it is claimed that the squaw went to the vicinity of the mine and took up with a leading stockman by the name of Prewett; that she showed Prewett the mine; but he, having no taste for mining, kept the thing a secret for 17 years. He then, for satisfactory reasons, showed the mine to David and Luther Burton. One thing is certain, the boys have just returned from opening the mine, and bring rich specimens of honeycombed quartz, highly impregnated with oxide of iron and well bespangled with fine gold. They claim the ledge to be eight feet wide, and in part silver-bearing, though for long distances the gold rock nearly crowds out the silver.

Indications of Tin.

There is some suspicion of a discovery of tin here. The ore fills the fissure-like trap, without any other matrix; has much the appearance of black oxide of manganese—black, very hard, fine-grained fracture, very heavy, patches in the black merging into brown, with a red streak in the center of the brown, which soils the fingers a bright red, but not a cinnamon red. It is claimed by the finders that with carbonate of soda, in a crucible at a white heat, it yielded many globules of a soft white metal, some the size of a pea. A specimen sent to the city was reported on as being sandstone and iron. This would be about as clear as to declare that it was not purified rock. One of the rocks is gray granite, the other is diorite merging into greenstone.

An Old Mine Rediscovered.

EDITORS PRESS:—Hearing that the old Mission gold mine had been rediscovered, your correspondent decided to investigate.

It has been known for a good many years that the Mission Fathers had a very rich mine somewhere in this part of the country, and until lately all efforts to find the same have failed. Within the last few weeks certain parties obtained information in relation to the situation of the old works, and the place that they are now working tallies with the description given. The story goes that when the Americans came into the country, the Fathers had the old shaft covered with heavy timbers, and over that the surface soil. The shaft was said to be about 20 feet deep, with a drift leading from that. Mr. Hartley is in charge, and gave what information he could.

The ground they have been working over is evidently the dump of the old mine. The vein has been laid bare about 40x50 feet. Mr. Hartley says that this particular part of the vein is a blow-out. The quartz shows signs of having been burnt slag, etc.

The quartz from the vein assays at \$20 per ton, and a specimen piece from the dump went over \$1000. The old shaft is being anxiously

looked for, as the discovery of that will settle the question, so it is thought.

The land is on the Cajon grant and belongs to H. P. McKoon, who has rented it to the parties interested. If anything further is found, I will report. ROBT. H. ASHER.
El Cajon, Nov. 5th.

An Immense Deposit of Ore.

EDITORS PRESS:—In the Santa Rita mountains lies one of the largest bodies of ore in the southern part of the Territory of Arizona. It is unknown by the outside world, but in future will be one of the best known properties in the "West."

It is at the base of the mountain known as "Signal Peak," next to the highest peak in Southern Arizona, which towers above it 400 feet.

The tunnel is 200 feet, running east and west, and of this 130 feet in ore and ore still in face. Eighty feet from mouth of tunnel is a crosscut in 60 feet, and all in ore, and the same at the face of tunnel. It is one mountain of iron pyrites ore. The assays run from \$3.10 in gold and \$2 in silver up to \$3 in gold, \$26 in silver. It is known as the Arkanian, owned by Wm. T. Powers, a mining man of this place, and one other party.

On account of it being such an immense body of ore, and of such a character, I trust it will be of interest to your readers. The formation is lime and porphyry, and the only ore of the kind in the vicinity. CRITTENDEN.

Reduction Works.

While the present boom of north and south railroad talk is at its height, the Prescott (A. T.) Courier wishes to gently say something about a matter of more vital interest to this section than railroads, and that is the erection of complete reduction works in this vicinity. Here we have the largest area of continuous mineral country known, the extent of which is only equaled by the number and richness of its mines. For twenty odd years a steadily increasing stream of ore and concentrates has been pouring out of this section to foreign smelters, while thousands upon thousands of tons of rich ore, but not rich enough to ship, have been left lying upon the dumps, which might be worked if we had complete works for the treatment of ore here at home. Why is this? Why is it that a purely mining country has no great custom mill for the treatment of the product of the country? Some who know a great deal more about ore than the Courier look wise and assert that we have not enough ore to support such works. While very few will agree with them, for the sake of argument, suppose we do. How long would the great smelting works at Omaha, Denver, Pueblo, El Paso and other places run if they were dependent entirely upon local output of ore, or even that of the particular States or Territories in which they happen to be located? We have oceans of ore to start on, and what has been done elsewhere can be done here. Suppose a lot of men should circulate around in Lowell, Mass., and talk against cotton mills, using arguments such as this: "Why, a cotton mill won't pay here; we have not enough cotton. There is not a single cotton plant in the State. In fact, you will have to transport all the cotton you handle nearly 1000 miles."

The argument sounds plausible enough, but it don't hold water, for the energetic New Englander has been running cotton mills a thousand miles from the cotton fields for years, and doing it successfully, too. We are in the same boat with the southerner, who for years studied how to concentrate his cotton into little bales so that he could ship it a thousand miles to have it treated, only we concentrate ore instead of cotton. For generation after generation the southerners concentrated their cotton and shipped it when it could have been worked on the ground to much greater advantage. Why did they do this? They did it because there were no energetic spirits to grasp the situation, because there was a lack of concert of action for the common good, and because there were wise men who said, "We haven't proper kind of labor," and so on. And so it went, until the fellows who treated cotton a thousand miles from its source got crowded, and some of them moved down to the cotton fields and astonished the natives by the greatness of the undertakings they carried through; and so it has been with us and our ore.

The time will come, of course, when some moneyed men will erect reduction works here, because they have been crowded out, and because ore shipping communities commence to treat ores at home. But what is the use of waiting for this good result until the third or fourth generation? Let us try and have reduction works in this generation. Don't let us confuse the workmen on the north and south railroad by too much railroad talk; let us give them a rest, and agitate the reduction works' proposition. Now is the time to build reduction works, and Banning creek, one mile south of Prescott, is the place.

A ROUND MILLION.—The California Electric Light Co. of this city has sold its plant to the Edison Light and power Company for \$1,000,000, represented by 10,000 shares of stock of \$100 each. This conveyance is subject to a mortgage of \$300,000, held by the California Safety and Trust Company.

Looking for Tin.

Methods of Testing Float and Croppings.

For many years the general supposition has been that there is no tin ore in America, and I believe that the Government at one time offered a large reward for the discovery of that ore in this country, writes a contributor to the Denver News. I do not know whether the reward has ever been claimed or not, but I do know that there is tin ore in various places in the Western States and Territories, and the time is not far distant, in my judgment, when tin in abundance will be produced here, not only to supply our own wants in that line, but enough to supply foreign lands, and thereby keep at home about \$30,000,000 annually, that is now sent abroad for that metal alone in its various shapes.

As there is now a very strong inducement for miners to prospect for it, I want to give a few pointers as to where and how to look for the ore, and how to know it when they do find it.

Where Tin is Found.

There are several facts to bear in mind connected with tin ore. Tin is never found in its metallic state; at least our best authorities on the subject claim that a pure tin crystal is the nearest approach to pure crystal that has ever been found. A pure crystal runs 78.4-10 per cent metallic tin. This is known as cassiterite by its scientific name, but it is simply the oxide of tin.

What is known as stream tin, are pieces of crystal broken off by the action of the elements from the crystal of the tin in the vein or lode, and have been worked down the gulches and streams below the lodes, for thousands of years past. This stream tin is found in all beds of alluvial gravel that lie between the veins of ore and is obtained by mining precisely like placer mining. In every pan of dirt washed in the tin district in the Black Hills, there is more or less of the stream tin along with the placer gold.

A great many miners throw this away as of no use, thinking it is iron. In some instances it is pure iron, but if you find these little nuggets below a lode or vein where you know there is mica, save all of them you get hold of and test them for tin, and in most cases you will get a good assay of that metal.

Tin ore in America is almost invariably associated with mica, and mica is found in the granite formation in a true fissure vein that carries a white or cream-colored spar, or what is known as alabite, frequently a stratum of crystallized quartz in the same vein, and in all of my many years of experience in searching for tin ore, I have never found any other ore or metal in the vein, except in one instance in the Black Hills. Then I found gold in the quartz that was imbedded in the spar. The spar contained the mica and oxide of tin, and nothing else.

In nearly every instance, the mica is found in hooks, and these hooks range in thickness from half an inch to three inches, and are lying in every conceivable shape you can think of except a horizontal position. At the bottom end of the hook, you find a piece of ore which you will at once pronounce an iron ore and of no account, but defer your judgment awhile; it may be iron and sometimes is iron, but in most cases it is an impure tin crystal.

How to Test It.

Now, then, you need to test it. If you think it is a tin crystal, take a pound or two and pulverize it as fine as it is possible to get it (you cannot get it too fine), then pan it out until the water is clear, and you will find a heavy powder where you would find the gold if hunting for that metal; but as you are after tin, you work a little differently.

This powder (if it is the oxide of tin, as you think it may be) will be one of five different colors. It may be a light or dark brown, a steel gray or a blue black in color. After you get this far with it, unless you are a fully competent assayer, dry the powder, send it to the best assayer you know of or call for an assay for tin, send him a \$5 bill, and if it is tin it is worth ten times that amount.

In some of the veins or lodes I speak of, there are tourmaline crystals and tungstate of iron in nuggets. Neither one of these is of any account whatever. The tourmaline crystal may be a six or eight-sided crystal, and of a brilliant jet-black color, very pretty to look at, but that is all they are good for. The tungstate of iron is of a dull gray color, bordering on black, and very heavy, but of not much use.

Whenever you find the mica in hooks, you will generally find the tin crystals with them or close to the hook in the spar in small minute crystals; but when you find the mica small and not in a hook form, you will find the oxide all through the vein, and although the spar may look to be pure white in color, take a glass and examine it closely and you will find very fine black specks all peppered over it, and so very fine as to be invisible to the eye without a good glass. After you detect the specks in the spar, pulverize a few pounds of it and pan it out down as low as you can to a fine powder of one of the colors I mention. That powder is an oxide of tin.

Back Hills Ore.

In some of the lodes of tin ore in the Black Hills, the oxide is disseminated throughout the spar, from wall to wall, so thickly as to make the spar look like a white granite. These veins are generally the richest in tin, and I know of veins there of this character that are 20 feet

thick and run from 10 to 15 per cent in metallic tin.

I have even assayed the granite wall rock on such veins, and found one to three per cent of tin in the granite at a depth of three inches from the gangue matter in the vein or lode. This fact proves to my mind at least that the oxide was originally in a metallic state, but by action of intense heat was reduced or rather altered to an oxide, and now has again to be reduced to metal by proper methods.

It will not do to say there is no tin in America. I have found tin during the past six years in the Black Hills of Dakota, and there is enough there to supply the world for ages to come, and in Wyoming, Utah, Montana, Nevada, Colorado, New Mexico and in Arizona, and I believe in the near future tin will be found in large quantity in all of these places. It only requires a careful examination of all the veins of spar in the granite formation that carries mica in the spar in any of these States I have mentioned to find tin ore. In so far as my own experience convinces me in the matter, there is no use to look for it in any other formation except the granite or where the micaeous slate and granite are together in place. There may be and often are other metals to be found in true fissure veins in these formations, but where the mica is found in the spar, either in hook form or in small particles, there you may very reasonably expect to find tin ore.

Mining with Snow Water.

R. K. Dalton of Montpelier, Vt., was one of a party of three New Englanders who were hunting in the Selkirk mountains, in British Columbia, last month. He left his companions in Tacoma and is returning home by way of San Francisco. When seen at the Russ House, in this city, he said:

"The most singular thing that I saw in the Selkirk mountains was the mining camp of two young Americans who were perched up near the snow line on one of the highest peaks. There are a few placer mines in that part of the range and these men had struck dirt, that paid very well, so high up that they could just get their breath and no more. There was no water, but plenty of snow, and the two Americans, Yankees they were, too, had utilized it by building a series of tanks or vats and erecting a steam boiler. How they ever got the boiler up there is more than I can understand, for it must have been hauled some 60 miles from the railroad station and over the rockiest and most precipitous path I ever saw. Steam pipes from the boiler went through the tanks and melted the snow the men packed in them. After the snow was melted the steam kept the ice from forming in the coldest weather, and the two fellows could work all the year around. The dirt paid splendidly or they would have lost money. There was plenty of gold, both in dust and nuggets. The men were bachelors, and they kept a French woman and her husband there to cook and help in the work. I never before came across so much system under so many difficulties."

Outlook in Butte County.

Supervisor A. E. Anderson, when asked his views with regard to the mining outlook in Butte, said: "The outlook is very bright, prosperous and flattering. All over the county in the mining sections the gravel deposits are being worked, and the returns are satisfactory. This is especially true of the northern part of the county in the regions about Magalia, Brown's Ravine and Gravel Range, and the mines being opened there are rich and permanent. These mines are mostly the old channels or the channels of old streams now covered with lava from 10 to 100 feet deep. They are as well defined as the ravines and creeks of the present day and they are rich in gold. Near Forthweston I have been at work a number of years developing a mine that I am convinced will pay well when the gravel is reached. I am now in 500 feet with the main tunnel, and expect to run from 80 to 100 feet farther. The channel I hope to strike is one of the ancient river beds and is under fully 100 feet of lava caps."

As you know, the quartz mining about Forthweston never looked as well nor was as prosperous as at present. I think the mines there are very permanent and will continue to be worked for many years. The success of these mines is encouraging people to invest and do a good deal of prospecting. Dodson & Co., at Mooreville, are rigging up for drift mining. Perkins, Higgins and others, near the Middle Fork, and Wheeler & Co., near Cascade, are among some of the best known gravel miners in our section of Butte."—Oreville Register.

THE LIDGERWOOD MANUFACTURING Co., New York, have secured the services of the widely-known house of Frazer & Chalmers to represent them in Utah, Montana and Idaho. Parties located in that section of the country, desiring to purchase machinery for all sorts of hoisting purposes, will find it advantageous to deal with Messrs. Frazer and Chalmers. Their reputation in the business world is indeed an enviable one, and the improved Lidgerwood Standard hoisting engines, which they will handle, are among the most perfectly constructed machines for the service intended in the market.

The Fruit-Canning Industry.

Among the developing industries of the State, that of hermetically preserved horticultural products ranks foremost. California canned goods are rapidly becoming the favorite in this and other lands. The markets are extending in sphere and in demand, and those engaged in the canning business prognosticate that a few years will see it develop into the leading enterprise of California.

Bright as this vision is, the facts prove it in no way overdrawn in probability. Each recurring season sees a heavier output, and an equally increasing demand, which unmistakably marks an epoch in the expansion of the business. This closing season has been an exceptionally busy one, and the results open a cheering prospect for the future, to both the grower and the merchant. Fruit has been plentiful, and at prices that prove satisfactory to both sides, and still enable the production to be placed in remunerative competition in all markets of the civilized world.

Peaches, apricots and pears comprise the bulk of the fruit put up, and the other fruits come in in proportion to the prolificacy of the crop. Berries of all kinds have been unusually scarce and high-priced, owing probably to the early rains and the demand for green shipment.

It is almost impossible to estimate the exact figures regarding the total number of cases put up this season, owing to the fact that many of the large canneries are still working. But an idea of the enormous amount can be gained from the fact that the Lusk Canning Company alone have already stored for this season upward of 1,000,000 cases of fruits and vegetables. This firm finds its principal consumption in the domestic markets, but also makes proportionally large shipments abroad, in which direction its trade is increasing rapidly.

Owing to the almost total failure of the Eastern crop last year, the demand for California goods was so great that the supply was about exhausted at the opening of this season. This, of course, leaves an exceptionally free market for this season's goods, and the indications are that it will be a long time in the future before the markets will have an opportunity to become overstocked.

Local merchants are of the opinion that there exists immense possibilities for the extension of the trade to India and Southern Africa. The present drawback to such an experiment seems to be a lack of adequate transportation facilities, but this they hope will be speedily overcome with anticipated new enterprises in the direction of marine commerce.

England, China, Australia, and other of the European countries, at present cover the widest field of the export trade.

The recent reduction in the price of sugar; lowering the cost fully one cent in the pound; gives an added stimulus to the industry of fruit canning on this coast, and puts the enterprise here on a more equal footing with other countries and States with which we compete in the struggle for the control of the world's markets.

Many of the cannermen, however, claim that this advantage is offset by the increased price on tinplate which brings the cost of cans to an additional eight cents on the dozen. This advance in price of tin is attributed generally to the effect of the McKinley tariff law; but there are also many who are willing to affirm that this is a mistake; the rise being due to a foreign combine on tinplates and recent strikes in the tin mining districts of England.

Whoever it may be, the result does not seem to materially affect the business, or dampen the sanguinity of the canners.

Although the domestic markets are in a flourishing condition, and fully capable of providing an outlet for the entire production on this coast, many of the more enterprising firms are endeavoring to establish a solid footing for their goods abroad, and are making many sacrifices and concessions to realize success. One firm alone, that of B. G. Smith & Co., recently sold from this season's goods, 30,000 cases of fruit through Townsend & Co. of Liverpool, and about 5000 cases to the Australian and other foreign markets. This firm makes a specialty of a high-grade class of fruit, and one of the delicacies that contribute to the dainty luxuries of the British aristocracy in this way has its transition from our California shores. The wisdom of maintaining a high standard of goods is demonstrated by the favor with which the "Anglo-Californian" brand is received abroad. So great has been the recent demand for this firm's goods, that the capacity of the factory has been increased to nearly double, and a side-track railroad run in alongside the warehouse at the foot of Second and Townsend streets.

A new feature, that greatly facilitates the condensation of the business, has recently been introduced into this, and other leading factories, in the shape of the "Wedgewood Capping Machine." This machine enables one man to accomplish the same amount of work that it formerly took four men to do.

This labor-saving invention does not in any way lessen the number of employees, as far as California is concerned, inasmuch as the trade expands with our ability and facilities to compete to the disadvantage of rivals.

Many of the large canneries employ upward of 300 hands during the busy months, and in

the aggregate, in this city alone, the enterprise furnishes work for about 2000 men, women and girls.

The firm of Shemmel & Co., one of the best known of the canned-fruit preparers, employs in its factory fully 250 hands nearly the whole season, and is making still further preparations for increasing its capacity of production to meet its extensive business. Its agents, Williams, Brown & Co., report that the output is complete and amounts to upward of 150,000 cases of fruit and 20,000 cases vegetables. The majority of the goods has already been sold to the domestic trade and to their own brokers in Russia, China, England and Australia. The output of the Cutting Co. will be found equally large when the reports are in.

By these few examples that have been reliably investigated, it can readily be seen that the canners of this coast have reason to feel jubilant. During the month of September—the heaviest shipment of the season overlaid—the figures were 12,075,000 cases and the average price can be safely approximated at \$3.25 per case of two dozen cases.

The great move of the future in connection with the industry on this coast will be the consolidation of the interests of the grower and the canner. There is a prevalent dissatisfaction with the loose and altogether inadequate method now in vogue. Both the greatly interested parties feel that it is obviously necessary to future success in the way of expediency and the proper limitation of cost of green fruit that the institution of the middlemen commissioners be allowed to drop into oblivion.

Steps are already being taken to bring the grower and the canner together on a business basis of mutual interests and profit, and for the time to avoid this needless expense.

Complaints are also rife against the difficulty of competing with cheap and inferior goods that are thrown upon the market. But it would seem that the brand ought to be sufficient protection to a superior article, though of course the industry of the coast will eventually suffer as a whole by these dishonorable practices of unscrupulous firms.

The complaints made by Ex-Labor Commissioner Tobin before the last session of the Legislature in regard to the inadequate ventilation and unhealthy sanitary condition of several of the canneries in San Francisco has undoubtedly been productive of good.

The particular factories that were specified have undergone an entire renovation, and clean, whitewashed walls and improved drainage render the condition of the workers more comfortable.

Mining Bureau Museum.

Recent additions to the collection of the State Mining Bureau are as follows:

Crystals of calcite, La Luz, Mexico; native copper, Carradon, Cornwall; tin ore, West Phoenix mine, Cornwall; silver ore, La Luz, Mexico, and Garnet, Mexico—all from Jas. F. Brooks, Esq.

Very fine specimen of pyrrhite (ruby silver), crystals, Copiapo, Chili, and iodyrite (iodide of silver), Farapico, Chili; from Hon. M. Rosenstock, Iquique.

Gold quartz, Kehoe mine, Mariposa Co., Cal.; Jerome B. Brown.

Sphalerite, pyrite and galena crystals, Webb City, Missouri; Edward Hooper Esq.

Gold quartz from footwall of the Cargo Muchacho mine, San Diego Co., Cal.

Sphalerite, Advance mine, Fresno Co., Cal.; Thos. Agnew.

Several specimens of silver ores from the North Fork District, Fresno Co., Cal.

Gold quartz, showing free gold, Grizzly mine, Los Burros, Monterey Co., Cal.; A. E. Moore.

Quicksilver ore, New Almaden, Cal.; Mrs. H. H. Day.

Large fine specimen of gold quartz from the Kennedy mine, Amador Co., Cal.; J. F. Parks, superintendent.

Crude sulphur (crystallized), Sulphur Creek, Colusa Co., Cal.; W. L. Bromley.

Fluorite crystals, with cockscomb pyrite and galena, Cumberland, England; Williamburgh Scientific Society.

Cinnabar and other specimens from Lake and Napa county mines.

Model of the \$200 gold nugget found last September in the Ruby drift mine, Forest City, Sierra Co., Cal.; C. D. Voy.

Aragonite crystals in basalt, Sulphur Creek, Colusa Co., Cal., and a number of other specimens of minor interest.

ANXIOUS FOR A RAILROAD.—Assemblyman A. J. Bledsoe of Eureka, Humboldt Co., has been commissioned by leading business men and property owners of Eureka to interview the capitalists of San Francisco, Los Angeles, Denver and other cities on the subject of railroad construction to Humboldt bay. The growing importance of Eureka as a shipping point, as well as the varied and extensive resources of Humboldt county, all lead to the conclusion that a railroad connecting this point with the transcontinental lines would be a good paying investment. The people at Eureka are willing to meet the enterprising capitalist half way, and Mr. Bledsoe is authorized to hold out flattering inducements to the company which will be the first to connect Humboldt bay by rail with the outside world.

COLD WATER ON RED HOT BOILERS.—Recent experiments abroad, according to reports thereof, made to show the effect of cold water on red-hot boilers, tend to a reversal of the common opinion that many explosions are caused by turning cold water into boilers while in that condition.

Sierra Placers.

Some Undeveloped Claims.

The Fresno *Expositor* says:

George T. Lemon, who has been mining on a branch of Stevenson creek, a short distance northeast of Pine Ridge, has returned to Fresno for the winter season.

Mr. Lemon was met by an *Expositor* reporter yesterday evening, and the following statements concerning the placer mines of that district were gathered in the course of a general conversation upon the subject:

It has been many years since any great amount of placer ground was worked in the locality, though the existence of the deposits was known to many persons. The gulches in all directions for many miles are placer patents, and some few who have not secured patents have been doing just enough annual work to retain the legal title to their locations.

The ground is easily worked, and there is a noticeable absence of bowlders and cement. The country is pretty well covered with alluvial and some rich float has been found, but the mother vein is so well obscured that search for it has never been prosecuted to any extent.

The gold of this district is coarse in quality, but the deposits are heavy and the nuggets are good sized, ranging from the size of a grain of wheat to that of a double eagle.

Mr. Lemon showed the *Expositor* man a small sack of dust, and the lumps averaged about \$5 in weight. The largest had some quartz mingled in them, and, though heavy, would only weigh about \$12 in gold.

The bedrock is from two to eight feet deep, and its nature is a soft, cheese-like, soapy, granite formation. Mr. Lemon has ground-elutriated about \$1200 worth of dust in the past three months, and has used no quicksilver at all, thereby wasting all the finer particles. He has a hydraulic with a 50-foot pressure, but has not had occasion to use it to any extent.

There is an abundance of water, and it laets the entire season, which is rather short in that locality, owing to the early and heavy fall of snows.

He will resume operations next summer on a more extensive scale, as he is convinced from actual results that that country is extremely rich in placer deposits of the precious metals.

The Indians do considerable panning on the numerous forks of the San Joaquin. They come occasionally to the Toll House, Pine Ridge and Hamptonville stores with small amounts of dust, which they obtain in rather a crude manner, as follows:

The river and creek beds are literally specked with float and fine gold, and the Indians wade and walk along the banks until they site an exceptionally rich spot, when they dive down with a scoop or large pan and fill it with sand and gravel. Coming to the surface, they go ashore and pan out the results, sometimes securing 5 or 15 cents worth of dust at a dive. The process is very slow and wholly original with the Indians, and they devote very few days to the search. They sell the dust to the storekeepers and obtain supplies of food in return.

The hundreds of little streamlets that country are gold bearing, but the work of ground sluicing and hydraulicking has not been prosecuted to any extent except on the very richest ones.

The results of Mr. Lemon's summer work will exert a strong influence in the matter of placer mining next year. Placers are essentially a poor man's mine, as the search for quartz is attended with too much uncertainty and too great expense. Campers, next season, will, no doubt, have pike, pans and shovels in their outfits, and do a little prospecting by way of amusement. Pockets are frequently found and the character of the creek bottoms and rich-looking plateaus will prove attractive and profitable pastime.

The owners of the patents should take encouragement from these rich rewards and go to work and erect hydraulic plants. The gold is there in paying quantities, and it only requires slight effort to secure it. Sluice boxes should have quicksilver riffles in them, as an incalculable loss occurs when an attempt is only made to secure the heavy pieces. To the man who understands the simple matter, the policy of the suggestion will be apparent at once.

It is not unlikely that the tunnel proposition, spoken of in the *Expositor*, some months ago, will be agitated this summer, as its completion seems to be the only manner in which the San Joaquin river bed can be successfully worked. The project contemplates the construction of a canal and short tunnel, whereby the entire river bed will be diverted for a short distance and thus enable the rich placer deposits in the bed to be reached. This proposition seems chimerical, but, should it ever be consummated, immense quantities of gold will be obtained, as the richness of the river bed is a matter of historical fact.

The *Expositor* predicts a busy and profitable season among the placers of the Sierras in that country, next year.

WHAT IS LAMINATION IN BOILER PLATES?—Lamination in boiler plates is due to imperfect welding of the metal while being rolled. It is caused by a deposit of silica, or scale, that prevents the layers of iron from uniting, therefore when the sheets are exposed to the fire the outer layer burns off, or peels, or bulges up in what are known as "blisters."

Proceedings of the Miners Committee.

Carrying out the resolution adopted at a recent meeting of the miners of Plumas county, says the *Plumas National*, the following gentlemen were appointed to act with the president, R. Thompson, of Spanish Ranch, as an Executive Committee: Hon. F. G. Hall of Greenville and Mr. John Nevill of Johnsville.

Pursuant to the call of the president the committee convened in Quincy, Nov. 4th. R. Thompson was elected chairman and Chas. R. Thompson, secretary. A careful view of the whole field was talked over, and it was unanimously agreed that some definite action should be taken to modify and dissolve the many injunctions now lying against the mines of Plumas county. It was the sense of the committee that Judge John D. Goodwin be employed as attorney, and Chas. R. Thompson was appointed solicitor, with authority to receipt for all sums received. The solicitor will soon be started, and make a canvass of the county, and it is to be hoped that every one will subscribe something. The following resolution was adopted:

We consider the resumption of hydraulic mining of vital importance to the future prosperity of the county, not only every miner, but interested, but every farmer, every man, whatever his vocation, and is to be largely benefited, directly or indirectly.

We congratulate you upon the growing sentiment among the people of the State in favor of hydraulic mining. Many of our enemies even concede the justice of our cause. Now is the time to strike for our rights, our interests and our homes, through the medium of our State courts. Now, that friends in the State are willing to help us, let us help ourselves by making and winning the fight here proposed thus restoring prosperity to Plumas and adding thousands to the wealth of the State. We ask you for what we believe your own and the justice good, not to hesitate about subscribing. We hope and confidently expect it to be repaid many fold.

C. R. THOMPSON, Sec'y.

The Carson River Dredge.

Nearly all the machinery has now arrived for the bucket dredge that is to be put on the scow in the Carson river to scoop the valuable material out of the bed of the river. J. H.

Rae now has a small force of men employed putting up the framework for the new dredge. He has also contracted with Mr. McCone of Virginia City for a small four-man mill to be erected on the river, and will, as soon as other work is thoroughly under way, put in a large set of sluices. Some of our exchanges have recently stated that the new dredge was to be placed on a car and run on land. This is not a fact. The machinery for lifting the material from the river will be on the boat, and as this material is brought up, it will be dumped into a Bennett amalgamator. After running through this machine the stuff will be run over a line of blanket sluices on the river bank. It will then be collected, and run through pans in the mill to be erected, and thence it will be run over a Flume or some other contrivance.

It will be seen that the enterprise is quite a large one. More interest is being taken in the scheme now than ever before, and there seems to be hardly a doubt of the ultimate success of the undertaking. The company really has a net of mines. First, it has a quicksilver mine, next a gold mine and lastly a sulphuretted deposit of vast proportions. The system of saving the material, we believe, is a good one, and it is estimated that not over 10 per cent of the material raised will get away. If everything runs smoothly, and the weather permits, the river in the vicinity of the dredge will present a scene of activity next spring.—*Lyon County Times*.

Marble, Granite and Clay.

There are immense deposits of hard, durable and excellent granite in Butte that will come day be utilized. These great granite formations are found in all the mountainous parts, but particularly along the Middle Fork, South Fork, near Bangor, on the Magalla ridge and on the Mountain House ridge. In the valley portion of the county they are lacking.

Good marble, hard and durable, and of snob a quality that it will stand cutting or lettering, has been found in many places. Nearly every color from white as snow to jet black can be seen. The marble deposits are very extensive on the Middle and North Forks of the Feather, and on the former stream in one place there is a gigantic mountain known as Marble Cone, formed of white marble.

We have seen specimens of Butte marble from the Magalla ridge, from Granite Blain and from Marble Creek near Merrimac Mills, that took a splendid polish and seemed as hard and durable as any imported marble. These beds will not be used till railroads are built into the mountains so as to reach them.

In days of various kinds, Butte is exceedingly rich, and when transportation becomes cheaper, we confidently expect to see pottery established. One gentleman has paid much attention to our clay and cement, and tells us that he is positive as good cement can be made here as the famous Portland cement that is so extensively imported.—*Oroville Register*.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BELMONT MINE.—*Ledger*, Nov. 14: The superintendent reports: Tunnel No. 1 is now in 465 feet; face all in ore of milling grade. The 315 feet of new pipe line ordered several days back is under good headway. The company expect to resume milling December 1st. J. H. Tibbitts, superintendent Belmont gold mine, has placed miners on the Middle Bar Hollywood, Astoria and Elephantine mines to do the assessment work for 1891. The claims are situated on the Mokelumne river near the Hardenberg mine.

WILDMAN.—*Cor. Amador Ledger*: Sinking was commenced at the Wildman this week. On account of having only one bucket to do the entire work of the mine, they concluded to hang up the mill for four weeks, which will in all probability suffice to finish the sinking. They propose to go down 100 feet. The water is strong, but they have four pumps—three powerful Corioish plunger pumps, and one drawing lift pump. They are sinking in the hanging wall, leaving the ledge to the west. The ground is a soft slate, which is a favorable indication, and will enable rapid progress to be made. Thirty men have been laid off temporarily, but in order to impose as little hardship as possible, they will likely be employed a part of the time in turn, so as to give all an equal show. Nine men are kept in the shaft, and six men are working on the stopes. Some ore will no doubt be extracted, and the dumps filled with rock in readiness for the starting of the mill.

Calaveras.

LIMESTONE MARKET.—*Calaveras Chronicle*, Nov. 14: The large smelter of the Campo Seco Co. started up about the 1st inst., and at first the indications were not favorable for successful treatment of the ore. By experimenting, the general manager found that lime rock would "thin" the material and cause the copper to run off freely by fluxing the molten mass, consequently a body of limestone was located on the Mok. Hill and Campo Seco road, near the McNamara place, and a force of men are engaged in quarrying the lime, while six large freight teams are hauling the same to the company's smelter. The stone is of superior quality and there is an abundant quantity on the company's location, the distance to convey it being but five miles. We are informed that H. A. Messenger has contracted to deliver 1000 tons for \$2.50 a ton, and the daily quantity required for "fluxing" to be 15 tons. Thus one more enterprise is started, and one that will prove not only lasting but profitable. We were informed that the furnace was now working to the entire satisfaction of the company and the ore was paying one-third more than they expected.

El Dorado.

NEW MILLS.—*Mt. Democrat*, Nov. 14: A fine 10 stamp mill is now being erected and will soon be ready to run at the Darling mine, where they are now taking out very fine ore. Two Huntington mills are now being started at the St. Lawrence mine, the outlook there is decidedly favorable. The Dalmatia is running regularly with her usual success. At the Talkey mine at Texas Hill they have their tunnel in 450 feet and expect to tap the gravel channel in 50 feet more. The upraise at the Blair mine is expected to tap the gravel at any time. Work at the Toll House mine at Smith's Flat, is progressing as rapidly as possible. Good gravel is now coming out of the old Granite mine at the same place. The mill at the Gentle Annie mine will at once be started up after a lay off for three weeks on account of repairs being made on the big ditch. The S. N. L. W. & I. Company have commenced work all along the line since they got the water through the main canal. They are now driving the north 700 foot level at the Pacific mine day and night. They are opening shafts at the Harmon mine preparatory to running levels for the purpose of stoping. After this work is completed they intend to start the mill up at the mine. As we have stated in a previous issue of this paper, they have 500 feet of back above the tunnel which will be ready to take out as soon as they have these shafts completed and levels run. At the Epley mine they have several thousand tons of ore in sight, that will pay from \$5 to \$6 per ton. Making repairs on the main canal has delayed them for a time, but the furnaces are now completed and are in such condition that they will not be delayed again for years to come. Five additional stamps with a new boiler and other machinery are nearing completion at the Welker mine, near Fort Jim. Work is progressing at the Baltic mine. The ore being taken out is worth \$30 per ton. A five stamp mill will be erected at this mine. A winze is being sunk at the Big Bonanza, and very good ore is coming out. This promises to be a big mine, as the vein is large and the ore rich. We get very favorable accounts from the Manzanita Queen mine in Diamond Springs District. We have been shown some very fine looking ore recently found in Kelsey District, which is said to contain 300 ounces in silver and \$60 to the ton. The ore certainly shows well and there is said to be a large vein of it. There is a belt of silver and gold bearing ore running through this county about three miles west of the mother lode range. If this should prove to be anything like as good as is claimed for it, it may become very valuable when properly developed. It has been partially opened at Big Canyon and other places and shows good looking ore.

Fresno.

OIL PROSPECTS.—*Fresno Republican*, Nov. 13: With every passing day the work of development of the oil fields near Coalinga is progressing with every promise that the fields will show all that was expected of them by the most sanguine. Oil was struck to the Coalinga country on July 26th last by the Coast Range Oil Company. The surface prospects for oil had showed good, and the first well was sunk. At a little over 70 feet sandstone was struck, and at 278 feet oil was found in sufficient quantities to complete the promise of oil made by the surface indications. J. E. Wilson, the superintendent for the corporation, took a sample to Los Angeles, and there the speculators would not touch it for some time, as they asserted it was so pure that it was

doctored. In fact it was, and is about 15 per cent purer in oil than the best ever found in Pennsylvania, and considerably better than the product of Los Angeles and San Buena Ventura counties. At last Messrs. Lacey & Rowland of the Puente Oil Co. of Los Angeles took the lease of the property and agreed to push things. In pursuance to the terms of this lease the Puente Oil Co. prepared to sink a well. The derrick is a substantial structure with several carloads of heavy timber and lumber in its composition. The work of sinking the well was begun only a short time ago, but it is now about 100 feet down and no oil in paying quantities. Others are turning their attention to the new fields and oil claims are being filed on rapidly by others than the original company or corporation. The Union Oil Co. is also said to have a surveyor and party in the field and will make some locations soon. The lease of the Puente Co. includes the 300 feet well now being operated, and the product thereof is being used as fuel in the engine which furnishes the power for sinking the new well. The developments in the fields are being watched with a great deal of interest.

San Diego.

THE GAVILAN MINES.—*Perris New Era*, Nov. 12: The organization of the Gavilan Mining and Milling Company was completed at Riverside last week by the election of the following officers: President, A. S. White; vice-president, J. A. Allen; secretary, C. W. Sylvester; treasurer, J. S. Castleman, general superintendent, Capt. J. H. Crossman. The stock has been capitalized at \$10,000, of which \$75,000 has been taken by some of the wealthiest men of Riverside. Preparatory work, in the way of building dwellings, messhouse, offices and making road, has already begun and will be pushed to completion within 30 days, when it is expected a force of 30 or 40 men will be put to work in the mine, developing it and taking out ore. The ore assays on an average about \$100 to the ton, and is free mill and easily worked. Capt. J. H. Crossman, who has been selected as superintendent, and to whose efforts is due the organization of the company, is a gentleman thoroughly experienced in mining, having been engaged in the business nearly all his life. In addition to the mineral wealth acquired by the company, there is a large extent of very valuable agricultural land, well adapted for all kinds of produce and fruit.

AT OTHER PLACES.—Last week W. Steel sold his group of mines and ranch property in Pinacate district, to J. Judson, a Chicago gentleman. At present Mr. Judson will do nothing with the mines, but will devote his time to setting out an olive orchard, for which the land is peculiarly adapted. In the spring, however, he will put a force of men at work on the mines, put up an extensive milling plant, and go to work in earnest. H. McPhee of the Press has leased part of his claim in Bon Air district to a couple of experienced miners, who will prospect it thoroughly. The mine promises well, and good results are expected from it. A tunnel 150 feet long was commenced this week, and the proprietors expect to ship some very valuable ore within a few weeks. W. J. Lyons, a San Diego mining man, who has been looking at properties in this section for the past three weeks, left for San Diego yesterday. While prospecting about nine miles east of town, he ran across a ledge of tin, samples of which he took with him to have assayed.

OTAY SALT PRODUCE.—*Otay Press*, Nov. 14: At the La Punta Salt Works, at the foot of the valley, Shaffer Bros. have their season's run of salt now housed, and will soon begin the work of putting it through the refining process, which is done by first grinding the salt and then placing it in a steam dryer, where it remains for about three hours, when it is taken out and reground very fine for table and dairy uses, and then put up in 250-pound sacks. This quality of salt is shipped to San Diego by means of a small schooner that is loaded at the works, and much of this salt in bulk finds its way to the northern portion of the State. The salt product for this season was 450 tons.

Shasta.

A SPLENDID PROPERTY.—*Redding Free Press*, Nov. 14: We hear most gratifying reports from the Gladstone mine at French Gulch. It is claimed that there is now in sight enough ore to run the mill constantly for the next three years. In a few days work will be commenced on the fourth tunnel, which will tap the ledge 1000 feet beneath the earth's crust. They have a solid hock of ore and can run on the ledge from the third tunnel up to the first. They have recently purchased a dynamo of the latest Edison patent with which to run their electric drills, and in a few days expect to have the dynamo working in good shape. There is much free gold ore, and, in fact, most of it is good milling rock. The monthly cleanup of this mine is \$13,000, and allowing \$5000 as the cost of running the property, there is a neat balance of \$8000 to be divided up among the stockholders.

IRON.—The stockholders of the Shasta Iron Company recently held a meeting and resolved to do nothing with their mine on the McCloud river except assessment work this winter; but in the spring it is believed that operations will be commenced. Two carloads of ore were shipped to San Francisco not long since, and the test made was entirely satisfactory, the ore working up to 95 per cent. Robert Radcliff has charge of the property.

Sierra.

EXCELSIOR.—*Mt. Messenger*, Nov. 14: Loeffler Cadeza and Lassait have received the contract a the Excelsior to run 200 feet of tunnel. The tunnel is in 1192 feet. After the 200 feet are completed the company expect to tap gravel, and, no doubt, will have a good mine according to present indications.

AN OLD CLAIM.—Messrs. Fish and Burgan have sold the old St. Lawrence drift claim, at Excelsior, to a man by the name of Anderson, a resident of that section in early days. It is said that he left good gravel unworked there when he left over 30 years ago, and he now intends to take it out.

ANTE UP.—We are pleased to learn that prospects in the Ante Up quartz claim, near the Mt. House, are favorable. The company has good rock in sight and quite a quantity of it.

Trinity.

A QUICKSILVER MINE.—*Nevada City Transcript*, Nov. 16: Joseph F. Cox, superintendent of the Midnight mine at this city, returned to-day from a trip to the Altona quicksilver mine, in Trinity county, midway between Trinity Center and

Castle Craig Station, on the California & Oregon railroad. Mr. Cox was on the first instant appointed manager of the Altona, and will fill that position in conjunction with his duties here. The claim was worked previous to ten years ago, and produced \$160,000 above water level, but since that time a controversy between members of the company who are now in a fair way to arrive at an agreement has prevented the continuation of development. The ore body is 600 feet long, and averages ten feet in thickness. It is what is known as four-per-cent ore, and abounds in crude mercury. A new road and two bridges that will make the haul from the mine to the railroad, only 14 miles, are to be built, and in the spring two Knox channel furnaces are to be put in. Mr. Cox is an experienced and successful quicksilver miner.

Tuolumne.

MINE SOLO.—*Tuolumne Independent*, Nov. 14: The McPherson & Hilton quartz mine, at Saw Mill Flat, has been purchased by A. Grahani, of Saw Mill Flat, and Thos. Conlin, of Columbia. This week they received a Hercules gas engine, 1½ horse power, from San Francisco, which will be used for hoisting. The tunnel is sunk 100 feet, and from the bottom of this shaft is sunk 100 feet, or 160 feet deep from the surface. The vein averages two feet in width. All the rock pays to grind, and occasionally nice pockets are found. The average is \$8 per ton, and the pockets swell the yield to an encouraging amount when uncovered.

NEVADA.

Washoe District.

CON. CALIFORNIA & VIRGINIA.—*Enterprise*, Nov. 15: 1500 level.—The west crosscut from the main north lateral drift, at a point 150 feet north from the shaft station, has been advanced 30 feet; total length, 90 feet, in porphyry carrying clay and some quartz. 1600 level.—The various openings on this level continue to yield some ore. 1650 level.—Have continued to extract ore of fair quality from the drift run west from the top of the upraise carried up 59 feet above the southwest drift. 1750 level.—Is working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. Have also extracted some milling ore at the point where the upraise carried up from the crosscut run west from the southwest drift made connection with the stopes on the eighth floor. Have continued to extract ore of fair quality at the point where the upraise from the southwest drift, 70 feet north from the south line of the California ground, connected with the eighth-floor stopes. There has been extracted from all parts of the mine during the week 990 1080-2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all the ore worked at that mill during the week (980 tons) was \$23.62 per ton. Bullion shipped to Carson Mint; assay value, about \$11,434.72.

OPHIR.—1465 level.—Have continued our prospecting work near the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore has been extracted during the week.

MEXICAN.—On the 1465 level the winze started at the end of the crosscut run west from the north lateral drift at a point near the south boundary line of the mine, 132 feet in, has been sunk 14 feet in porphyry carrying quartz of very low assay value.

UNION CON.—On the 900 level the joint Sierra Nevada and Union Con. west drift is now out west of the shaft a distance of 1352 feet, and the face is in clay and porphyry.

GOULD & CURRY.—200 level.—South drift from east crosscut No. 1 has been extended 18 feet through old fillings of a fair quality; total length, 53 feet. West crosscut No. 1, 65 feet above 200 level, has been advanced 20 feet; total, 231 feet; face in porphyry, clay and stringers of quartz.

BEST & BELCHER.—1000 level.—Upraise No. 1 has been carried up a distance of 9 feet through hard porphyry; total height, 27 feet. Have done considerable repairing on the 1200 level during the week.

Eureka District.

A DEVELOPMENT IN THE DUNDERBERG.—*Eureka Sentinel*, Nov. 14: We hear that the Dunderberg Co. has struck ore on the 800-foot level of their mine. We are not advised as to the extent of the development though we understand that considerable good ore is being brought to the surface. This find is important, as being deeper than any ore hitherto developed in that particular section of Prospect mountain. In the early days the Dunderberg was one of our most productive mines, having yielded more than \$2,000,000 in bullion. We may at least hope that the recent strike at depth will prove more valuable than the upper levels.

Reese River District.

GOOD TIMES AT AUSTIN.—*Reville*, Nov. 13: The Austin M. Co. have, at present, 50 men at work in the Union mine, and are constantly putting more to work as soon as a place is made ready for them. All the employees of the company received their month's earnings Tuesday, and about \$6000 worth of checks was cashed. It is four years since this number of men have been on the pay-roll in Austin, and in place of the sorrowful countenances, caused by the depression which hung over our camp, we now notice complacent smiles; pessimists have changed to optimists; business is on the revive, and every indication points to long and continued prosperity.

Tuscarora District.

DEL MONTE.—*Times-Review*, Nov. 13: Second level.—West drift from No. 1 joint raise has connected with stopes. North drift from No. 2 joint raise in 25 feet. Hoisted 55 cars of ore.

NORTH COMMONWEALTH.—Second level.—West drift from south drift extended 20 feet. West drift from No. 1 joint raise has connected with the stopes. Winze from stopes down 10 feet 18 inches good ore in bottom. Hoisted 6 cars first-class and 30 cars second-class ore. Stopes are looking well. Shipped to the railroad 31 tons first-class ore.

NEVADA QUEEN.—South drift from second level of Commonwealth advanced 21 feet, exposing good ore in bottom of the drift.

COMMONWEALTH.—South drift from No. 2 raise entered the vein and follows the footwall, showing some very high-grade ore. Progress for the week, 25 feet.

NORTH BELLE ISLE.—No. 3 north drift, 400-foot

level, has been advanced 10 feet; vein remains unchanged since last report. No. 2 upraise from the drift extended 15 feet. A crosscut east, at the bottom of No. 1 winze below the 400-foot level, has been commenced. Progress seven feet, cutting some good ore below the fault mentioned in last report. East crosscut from north intermediate drift above 400-foot level extended six feet and stopped. North intermediate drift above 400-foot level advanced six feet. Line crosscut, 400-foot level, Belle Isle, advanced 12 feet; face looking more favorable. Stopes are producing the usual amount of good ore.

BELLE ISLE.—North drift, 150-foot level, advanced five feet in very hard rock. Line crosscut, 350-foot level, extended 18 feet and remains unchanged. Stopes are producing the usual amount of good ore.

Piocha District.

The two furnaces are doing well and the output of bullion is very satisfactory. The locomotive is kept busily engaged night and day bringing in ore and wood and has all it can do to keep the smelters supplied. An oil house has been erected away from the main building so that in case of fire, it cannot come in contact with the main works. The slag dump is now being extended as far as possible around the pond embankment, making a substantial breastwork to support the loose ground. Upon the completion of the new locomotive it will at once be put on the Jackrabbit route, while the one now running on that section will take the Yuba, Meadow Valley and Raymond circuit. Quite a number of the hoads are beginning to erect dwellings in the vicinity of the works. The various styles of architecture would puzzle a modern architect to know what period the plans were drawn from. It is the intention of the superintendent to adopt stringent measures in regard to employees not being on hand at the time of their regular shift. No excuse will be allowed men for not being on duty unless in case of sickness and notification of the fact made before the shift goes on. Following are the amounts of ore smelted during the week, and the amount of bullion produced at the smelters: 1,203,990 lbs of ore and 923 bars of bullion. Counting the tonnage of ore, and assuming the bars of bullion to weigh 100 pounds each, the above report shows the smelting charge to carry from 8 to 10 per cent of lead. On the 10th inst. No. 1 furnace was barred down.

ARIZONA.

MILL NEARLY READY.—*Prescott Courier*, Nov. 13: The Parnell mill machinery is all on the ground and being put up as rapidly as possible, and it is expected that it will be running within three weeks. Paul Johos is at the Mammoth mine, Silver Mountain, where he has a gang of men at work. This mine is located 4½ miles south of the Tiger, and, as its name indicates, is a mammoth ledge. It is a contact vein, 300 feet wide and all ore, between granite and schist walls. Prospectors familiar with the Gladiator mine, on the War Eagle ledge, 35 miles from Prescott, say it is a wonderful piece of mining property. For 6000 feet the vein can be plainly traced on the top of the ground, and rock from any point on the surface of the ledge runs \$20. As it is a well-established fact that mines in this section increase in extent and richness as depth is reached, a few thousands spent in developing the War Eagle might bring about wonderful results. Judge Noyes has returned from a trip through the mining districts, where he went as much for curiosity as anything else, to look at a lot of old mining claims which he located and knew of many, many years ago, but which were abandoned from various causes, some of their owners having long ago crossed to the other shore. He states that nearly all these old claims show recent work, most of them being developed by deep shafts or long tunnels, and as a matter of fact, those showing the largest amount of development also show the best veins of rich ore.

COLORADO.

TITUSVILLE MILL.—*Silverton Standard*, Nov. 7: The Titusville mine and mill are running day and night on the new strike of rich gold-bearing quartz made recently, and the grade of the concentrates is running very high, while the amount of gold caught on the plates is heavy. A large force of men is employed on the property. The Mountain Quail, on Little Giot mountain, is turning out \$500 gold quartz, a shipment made the other day yielding over \$400 net in clean cash. The property is only a prospect, and has been lying idle for a long time. The Iowa mine, in Silver Lake basin, is working and shipping steadily, and everything is made snug for the long cold season. The mine has been a steady shipper all spring and summer. Down at the Thunder mine, they are taking out blocks of gray copper that are as large as bushel baskets. The fact that such ore bodies are being unearthed in that part of the district would indicate that the back of the old Sultan has hardly been scratched yet.

DAKOTA.

D. & D. SMELTER.—*Deadwood Pioneer*, Nov. 10: Both of the furnaces at the D. & D. smelter are now being modified by the addition of lead wells. It is stated that the reason for this lies in the fact that too great a loss of silver occurs by volatilization in straight matte smelting. By passing the matte over a well filled with lead, it is desilverized to a great extent, and the loss in subsequent roasting greatly reduced. Some lead carbonate ore from the Hayes mine at Galena, which has a contract to deliver 50 tons, is now in the ore bins. A fine grade of pyrites, assaying, it is said, over \$40 per ton, has been obtained from the Dakota mine, in Strawberry gulch, but only about five tons have so far been delivered. Two wagon loads of carbonate ore, amounting to about four tons, were hauled to the smelter Monday, from a group of claims near Virginia City, owned by Bert Harris and others. It is said the works will be in operation again in about two weeks.

CORA MINING COMPANY.—This mine is situated at Galena, and has been worked more continuously than any other mine in the Bear Butte district. All

of the ore has been of a high grade, principally galena and lead carbonates. At present, five men are employed, and the mine produces about half a ton per day of lead ore. The average value is about \$200, according to the returns from Omaha. The company is now entirely out of debt and has a small surplus to the treasury, which is being added to monthly.

IDAHO.

PUMPED OUT.—Wood River Times, Nov. 11: Thad D. Bellinger is in from the King of the West mine, in Smoky, where he has charge of the machinery. He says that the mine is just pumped out, that the winter supplies are all in, and that by the end of next week about ten men will be put to work for the winter. The draining of the mine was no small job, as there were over 1500 feet of shaft, winzes, raises and drifts, besides the stopes, to pump out, and for a while it seemed as if a fresh body of water had been tapped. Seventeen days were required to drain the workings.

ARIZONA.

IN MOHAVE CO.—*Miner*, Nov. 14: The Music Mountain mines are showing up well under development. The claims of Wm. Muon are splendid silver-producing properties, and the gold mines of that region are unexcelled. Hitchcock & Brumach have finished timbering the Tuckaboe shaft and stopes, and have just started in taking out ore. Cooley & Tyler are taking out an immense amount of ore from their new location situated between the C. O. D. mine and Canyon station. The ore is reported to be very high grade. Ed Henson is in from the Arlington mine, on Sherum's Peak, near Mineral Park, where he is working at present. He informs us that he has two carloads of high-grade ore on the dump which will be shipped to the sampler next week. In the drift from the bottom of the Diamond Joe shaft a fine body of ore has been struck. The ore is solid black metal, and the streak is fully 18 inches in width. Conrad & Conrad are hard at work on the Little Boy mine. They have been engaged in timbering up the tunnel, and will soon commence driving ahead under the ore. The Flores mill was started up Wednesday, and everything was running smoothly when our correspondent left. There are several hundred tons of ore on the dump ready for crushing. Davis & Garrett will make a large shipment of ore from the Western Vine mine, on Sherum's Peak, in a few days. The drift from the 100-foot level of the Berkeley mine is being pushed ahead, and is now nearly under the old shaft. The immense ledge of gold ore running 99 per ton, recently discovered in Gold Basin will soon become one of the great bonanzas of the coast. The Colorado river furnishes ample power to run a 200-stamp mill and dynamos to give power and light at the mine. The entire expense of fuel would be overcome. The river current runs at the rate of 10 miles an hour at a point where a mill could be placed and current wheels could be placed therein without number. Ogden and Bissett have a carload of ore at Hackberry awaiting shipment to the sampler. The ore was taken out in sinking the shaft on the Olympia mine, in Cedar district, upon which they have been at work for the past three months. The mine has been opened up in such shape that a number of thousand dollars in ore can be knocked out before the first of the year. From samples taken of the carload now awaiting treatment, it is expected that the boys will get \$1500 over and above all cost of extraction and reduction. They have a large quantity of 100-ounce ore on the dump, which will be shipped to the sampler at the next cleanup.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City Enterprise, Nov. 13: T. S. James has a lease on the south extension of the Pacific, and has 12 inches of good pay ore. The Grant County M. and M. Co. turned out ten silver bricks during the past 12 days. The smallest brick weighed 44 pounds and the largest 87 pounds. The mill runs day and night and is never short of ore. It is proving a great benefit to many miners in this section. The Uncle Sam mine has been handed to the Grant County M. and M. Co. for \$50,000. During the term of the bond the company will work the mine, paying the owner, Jo E. Sheridan, a royalty on all ore milled. In doing the assessment work, the ore taken out and shipped to the mill returned a 700-ounce brick, which was shipped via Wells Fargo on Wednesday. The Maud S., on Silver Creek, shipped another of those gold and silver bricks weighing 114 pounds and valued at \$2500. This was from a ten days' run of a five-stamp mill, stamps weighing 450 pounds each. Frank Vingoe has been shipping ore to the Grant County M. and M. Co. of this city, and as a result was able to reduce the indebtedness of his company about \$2000 on the first shipment. He expects to continue to ship ore to this city, and will have all of the indebtedness paid off by the first of the new year. James St. Clair, who, in connection with Jeff Christian, is leasing on the Red Cloud, at Black Hawk, informed the Enterprise that they are still in bonanza. They have seven tons of ore out, five of which will be shipped by express. Several different parties leased and worked the Red Cloud, but gave it up before good ore was struck.

UTAH.

CAMP CROSSCUTS.—Park Record, Nov. 14: About two feet of snow on the level is reported up at the Crescent mine, which means that bare ground will only be seen in spots until next spring. The Crescent tramway was closed down permanently yesterday. The engine is housed, cars put away, and everything made snug for the winter. The large amount of honest prospecting that has been and is being done on Treasure Hill should be productive of a rich find before spring comes again. It is about time another rich ore chute was discovered on that hill, and the general opinion is that it will be before long. The Silver Key has an enormous vein of low-grade ore, but the present low prices of silver and lead prohibit its being stoped and concentrated. A raise is now being run to connect the tunnel with the old shaft. The Roaring Lion lessees have laid in a supply of 145 tons of coal, besides making other important arrangements to prosecute developments all winter. The mine is looking extremely

favorable, and the indications are that Messrs. Gitsch, Rice and Sullivan are lucky men. The winze is going down steadily, and the vein is improving with every foot in depth. Considerable ore is being taken out and stored. The report of the rich strike in the West End group last week turns out to be a mistake, none of the officers of the company knowing anything about it. The ore exhibited around town came from the incline, but was a picked sample, as quite a number of bunches of rich ore occur in the vein. Henry Newell is now vigorously prosecuting work on his group of claims located on Treasure Hill. He is driving a tunnel to cut the contact and means to keep at it until he proves the ground. The group is a valuable one in the judgment of men who know the formation of that hill.

WASHINGTON.

GOOD ORE.—Oregonian Outlook, Nov. 6: The Wehe brothers at Golden recently shipped to the Tacoma smelter 13 tons of ore from the Adela which milled \$125 per ton. With a mill on the ground this ore would pay large returns. M. S. Dudley has just received returns from the shipment of Dexter ore made about three weeks ago. It went \$265 a ton in silver. While this is not quite as high as the owners expected it to run, as a mill test the result is altogether satisfactory.

SILVER STAR.—Capt. Curtz, general manager of the Silver Star Mining Co., which recently commenced development work on their Palmer mountain prospects, was in Concomely several days this week. He reports the Silver Star looking fine at a depth of 75 feet in the shaft. During the recent visit of J. D. Caughran, who represents the Tacoma interests in the company, it was decided to put up a whim and continue sinking, at least, to the depth of 200 feet. If the ledge looks as promising at the 100-foot level as it does at the present time, when that point is reached additional force will be put on and the work of drifting and sinking prosecuted at the same time.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 10, 1891.

- 462,938.—WARDROBE—W. T. Cottier, Los Angeles, Cal.
- 462,936.—DENTAL ENGINE ATTACHMENT—E. D. Eddy, San Mateo, Cal.
- 463,111.—FRUIT CRATE—C. E. Gates, Oakland, Cal.
- 463,042.—HYDRAULIC ELEVATOR VALVE—C. I. Hall, S. F.
- 463,049.—DIFFERENTIAL IN ROLLER MILLS—L. D. Harding, Colfax, Wash.
- 462,952.—GOLD-SAVING APPARATUS—J. H. Hobart, S. F.
- 463,053.—METALLIC ROD-PACKING—J. B. Houston, S. F.
- 462,953.—DAMP-PROOF AND WATER-TIGHT CELLARS—P. H. Jackson, S. F.
- 462,800.—PIPE PUNCH AND CUTTER—J. O. Kafader, Fort Bidwell, Cal.
- 462,768.—CROSSCUT SAW—Wm. Kidd, Fisherman's Bay, Cal.
- 462,955.—HYDRAULIC ELEVATOR—A. J. McAdam, S. F.
- 462,986.—POWDER DISTRIBUTOR—W. D. McCann, S. F.
- 463,071.—CAR CONSTRUCTION—G. W. McNear, Oakland, Cal.
- 463,068.—HOSE-HOLDER—J. & R. H. Moore, S. F.
- 462,954.—STOVE FOR HEATING AND LIGHTING PURPOSES—J. T. Myers, S. F.
- 463,084.—MOUTH-PIECE FOR CORNETS—C. H. Van Allen, Halsey, Oregon.
- 463,013.—TAIL-PIECE FOR STRINGED MUSICAL INSTRUMENTS—W. Van Deventer, Tacoma, Wash.
- 462,755.—BUCKLE—A. E. Winlow, San Jose, Cal.

The following brief list by telegraph, for Nov. 17, will appear more complete on receipt of mail advices: California—William Cameron, Milpitas, hit stock; William W. Flewelling, Kingsbury, hub and axle; Erastus W. Ceddings, San Francisco, wash boiler; John Hackett, Oakland, dock scraper; William Leavgood, Sacramento, wagon jack; Mark P. Madden, Coronado, device for tapping mains; William Martin, Glenwood, fumigator; Robert B. Vanderberg, Long Branch, fruit gatherer; George Weeks, East Oakland, railway rail joint coupling; Mora M. Barrett and J. F. Daly, San Francisco, two patents, one for operating the mechanism for gas engines and the other for a valve regulating the governor for gas engines.

Oregon—Robert R. Richardson, Portland, mail wagon.

Arizona—Frederick A. Blackburn, Bisbee, buckle fastener.

Nova Scotia—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC ORGAN.—Geo. F. Wells, S. F. No. 462,460. Dated Nov. 3, 1891. This is one of that class of organs using perforated music paper and known as automatic organs. The invention is applicable to pipe-organs and to those organs which, while employing reeds, have, by reason of their peculiar construction, the effect of pipe-organs, and which are known to the trade as "vocalion" organs. The main object of this invention is to adopt pipe and vocalion organs to be operated by perforated music paper. The invention consists, in addition to a novel pneumatic valve-operating mechanism, of means by which the perforated music paper controls and operates that mechanism.

STOVE FOR HEATING AND LIGHTING PURPOSES.—John F. Myers, S. F. No. 462,954. Dated Nov. 10, 1891. The object of this invention is to provide a device by which the inventor is enabled to use an ordinary coal-oil lamp within a grate or fire-

place, and by the employment of a peculiarly constructed inclosing casing, to prevent the flame of the lamp from being affected by the usual strong draft of the chimney-flue. It has also for its object a means for providing a proper circulation of air about the lower part of the lamp and oil-chamber without subjecting it to the chimney draft, a means for concentrating the heat and projecting it into the room, and a means for opening communication with the chimney in order to discharge the odors arising when the lamp is extinguished, and prevent their escaping into the room. The device is adapted to be fitted into the fireplace or opening for any grate by simply removing the basket and ash-pan therefrom. The heat will be thrown out by direct radiation and by the action of the reflector behind the lamp, and the room will at the same time be lighted sufficiently for ordinary purposes.

HYDRAULIC ELEVATOR.—Alexander J. McAdam, S. F. No. 462,955. Dated Nov. 10, 1891. This is one of that class of elevators operated by means of water under pressure acting through moving pistons connected by suitable ropes or cables with the traveling cage or car. The object is to provide a simple and effective hydraulic elevator in which great economy in the consumption of water is secured.

DAMP-PROOF AND WATER-TIGHT CELLAR.—Peter H. Jackson, S. F. No. 462,953. Dated Nov. 10, 1891. This invention relates to building, basement, cellar and vault constructions. The object is to increase the stiffness and strength of walls or floors of buildings without increasing their thickness, so that a structure will remain integral or as originally constructed even after great lapse of time, will resist tensile strain, remain erect under the weakening effects of fire, and may even be able to withstand earthquake shocks and oscillations; to construct basements, cellars, vaults or the like in such manner that the inside will be entirely free from dampness; to construct foundation walls or the walls of basements or cellars on soft bottoms in such manner that they will be capable of sustaining the buildings above them without the employment of piles or other ordinary means for upholding foundations on soft bottoms, and, finally, to prevent the tops and bottoms of stiffened walls from being pushed inward when subjected to pressure from without. With these objects in view, the invention consists in a wall, floor or the like, having upon its top surface supporting walls, and comprising in its structure, along with surface masses of concrete or the like to resist compression, metallic ties or beams embedded slightly beneath the interior or upper surface for the purpose of resisting tensile strain from transverse pressure inward or upward; furthermore, in a wall, floor or the like, composed of two portions—an outer and an inner—the outer portion capable of resisting compressive force and the inner portion capable of withstanding tensile strain, the two portions united by a stratum of asphaltum, or any equivalent water-resisting substance, extending along the neutral axis of the wall or floor, whereby the cellar is rendered damp-proof, and by exclusion of moisture, the metallic parts near the interior surface of the wall are preserved in a constantly dry condition, and any relaxation of the adhesion of the cement thereto is prevented; furthermore, in a wall or floor consisting of an outer and an inner portion united along its neutral axis by a stratum of damp-proof material, the outer portion constructed of cement, artificial stone, or the like, and the inner portion composed of similar material and provided with metallic ties or small beams embedded in it, whereby tensile strain may be successfully withstood and the floor or wall be prevented from bursting inward; furthermore, in a wall or floor composed of two portions united along the neutral axis by a stratum of damp-proof material, the outer portion made of cement, artificial stone, or similar material capable of resisting compressive force, and the inner portion constructed of like substance and consisting of inverted arches having metallic ties or small metallic beams embedded in the foot of the arches for the purpose of withstanding the tensile strain; furthermore, in the combination with the walls having metallic beams, of beams and hocking pieces to resist pressure above or below, or both above and below, and, finally, in various novel details of construction whereby the objects of the invention are attained.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

OCCIDENTAL MANUFACTURING CO., Nov. 12. Capital stock, \$1,000,000. Directors—Thos. Price, A. F. Price, J. N. Steinberger, F. J. Field and C. E. Gruban Jr.

PHELPS MANUFACTURING CO., Nov. 12. Capital stock, \$50,000. Directors—W. S. A. E. and A. Phelps, W. H. White and P. B. Horton.

GEO. E. PLUMMER & CO., Nov. 13. Capital stock, \$100,000. Directors—G. E. Gormley, J. J. Gormley, Jennie T. G. E. and W. P. Plummer.

DEL MONTE FRUIT-GROWING CO., Nov. 13. Capital stock, \$150,000. Directors—T. Cleary, R. M. Mastick, J. Willard, O. F. Norman and Robt. Jardine.

ARGYLE CON. M. CO., Nov. 17. Location, White Pine Co., Nev. Capital stock, \$1,000,000. Directors—Chas. H. Fish, J. D. Fry, James Treadwell, J. Stadfeld and H. G. Blasdel.

SUTTER COUNTY CEMENT MFG. CO., Nov. 17. Capital stock, \$500,000. Directors—C. E. L. Cross, Hom Wrede, J. Chitwood Jr., T. M. Davis and W. H. H. Graves.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
Geo. Wilson—Sacramento Co.
J. H. CROSSMAN—Fertile, Cal.
CHANDRY A. DAYTON—San Lucas, Cal.
G. R. GIL—Cambridge, Cal.
WM. T. HEAD—Ukiah, Cal.
Mrs. GEORGE DECKER—Fillmore, Cal.
ROBERT H. ASHER—El Cajon, Cal.
F. K. MERRITT—Healdsburg.
FRANK A. SWEETSER—Yolo Co.
W. E. BRAYTON—San Benito Co.
J. T. ADGIST—Tulare County.

Mining Share Market.

The advice given last week that a profit in hand is better than the promise of larger profits by holding, proved true the past week, and those who acted on it have no reason to complain. From the lowest quotations in this month, several of the stocks, notably of the Gold Hill and Devil Gate mines, doubled in value. From the highest price reached there was a decline of from 15 to 30 per cent. The situation at the mines and the condition of the stock market warrant much better prices for many of the shares. The only danger to be feared is that when the pool makes the market more active at much better prices, the gudgeons will come in as buyers, and in their scramble send prices above what the situation warrants, which, if done, will allow the pool to unload, short the market and through cross-orders send prices down with a rush, leaving outsiders with stock on which to pay assessments for some time afterward.

Outside mining shares begin to act suspiciously strong, as if they are under manipulation for much better prices. These shares have been unduly depressed, with assessments levied at regular intervals, until the outside public, who had been induced to buy at high prices on big bull points, had been frozen out at the time when they should have bought. While the depression was under way, extensive and systematic prospecting and developing work was done in the leading mines in the Tuscarora, Bodie and Quijota districts. Ore in several of them was not only found, but cut on two or more levels in its downward continuations. As each level was opened up, it was connected with those above for ventilation and better working, so that the mines are in most excellent condition for future working and extraction of ore, and as the shares are quite low, it looks as if those who buy and pay cash will make a good round profit on the venture.

Mining shares opened this (Thursday) morning inactive, continuing dull in the informal session, up to 11:30 o'clock, when, under a bear raid on the North End shares, the prices shaded off, which had the effect of bringing in outside sellers. There is a strong feeling that the lateness of the season, with the holidays being near at hand, will interfere with a successful bull movement. Reports are current of a pending assessment on Challenge, Crown Point, Potosi and Best and Belcher. If the market is down or around to-day's prices, when they are levied, it is likely the shares will not shade off much, but if it is higher, then it is reasonable to look for a decided set back.

Street reports are current that there is a pool formed by brokers and a few outsiders, which has been buying Belcher and Sierra Nevada, and are now after two of the Gold Hill mines. A diligent inquiry, resulting in our tracing the stock to T. Whitely & Co., brokers, who confirmed the statement that they held a large block of stocks of each of the mines, but they would not give any particulars, or why and for whom they are held. To an outsider it looks as if a contest for control of the mines is near at hand, yet it may be a trick to draw in outside buyers to unload at a good round profit.

The suit of M. W. Fox against the directors of the Hale and Norcross for over \$2,000,000, which it is alleged, was misappropriated, is on trial before Judge Hebbard. Interesting developments are looked for. Both sides are fighting hard and leaving nothing undone to secure a favorable verdict for their respective sides. At the opening trial on yesterday, H. M. Levy, president, and Mr. Keating, superintendent of the mine, were absent, but why is an open question.

From the Comstock mines, our advices are very favorable. It is claimed that there is an improvement in the Con. Virginia north drift running toward Ophir, which ought to make itself felt soon in the share market. In the Mexican winze, favorable news is looked for soon. In both Union and Sierra Nevada, the developing work is said to be looking well. In Best and Belcher, and also in Gould and Curry, the work is important; but another assessment may be required before the management will be able to show up anything. Extensive developing work is still under way in Savage and Hale and Norcross. In both mines, they are uncovering considerable good to high grade ore. The drifts that are being run from Potosi into Chollar will bear close watching. Bullion appears to be working on its own responsibility, looking to the development of some good to high grade ore. The work in Ward shaft appears to be mainly to develop at that depth Julia, Potosi, Bullion and Exchequer. Good results are looked for, but another assessment may be required to bring it out to perfection. It looks as if Challenge and several of the other Gold Hill shares are being quietly picked up by strong buyers, owing to the work going on. This work, which is mostly secret, is of a most important nature yet it may take several months before a good showing will be made. They are opening up several levels to the west. In the Alta group, bullish reports are afloat. In Belcher, a crosscut has been started on the 300 level, to cut the downward continuation of the ore assaying as high as \$35 found on the 200-foot level.

From the outside mines, our advices report that rich ore continues to be saved in several of the Tuscarora mines while opening up several levels for better working and the extraction of ore. Similar advices come to hand from the Bodies. From the Quijota mines, our advices report more active development work under way, and that the mill will start up soon. It is expected that in the Central and Emma mines, men will be put to work soon, so as to open them up. In Eureka, Holmes and Mt. Diablo, active developing work, with the extraction of ore, is under way. In Silver King, rich ore has been struck near the grass roots.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

MECHANICAL PROGRESS.

Hammering Saws.

Of the very numerous sawyers in mills scattered all over the country, not one in a thousand has as yet learned that most important part of saw tactics, adjusting the tension and truing up a circular saw. Many sawyers say they can straighten a long saw, but 90 per cent do not know how to take a twist or wind out of it, so it will lay down flat and touch at all four corners. A long and a circular saw are much alike in this matter, although a different method is pursued to accomplish the same result. This is done with a hammer beat of about six to eight pounds weight, on a smooth-faced anvil, round and rounding face, using a straight edge 40" to 48" and one about 10" long for testing in various ways. A twist pen is best for truing up in most cases.

In taking one, step by step, through the methods of treating various fanits of saws, each part is as essential as the other to know; and, until the whole is pretty well learned, the sawyer will not be satisfied, but he must not be discouraged, nor yet think he has it until results justify his expectations. A large round piece of metal, or a long strip like a crosscut or drag saw, has to have an even tension throughout to lay or stand in a true place; further, this tension is varied by what the thing has to perform after the proper tension is secured to make it true. For instance, a 50" circular saw running 800 to 900 times per minute, is thereby stretched on the rim more than at the center. This buckles the edge in reverse curves and causes the saw to run out of a true plane to get by this. Now, when the tension is increased at the center to some extent by hammering, and the edge is expanded by speed, the saw will become equal throughout and not buckle.

Most substances are more or less elastic—that is, they change shape and return to their former shape as soon as the conditions causing this change of shape are removed. When the pressure is great enough to overcome this elasticity, the thing remains set to the shape conditional to the power applied. Take, for instance, a piece of wax and pinch between the thumb and finger. The part immediately between the thumb and finger is compressed and crowds the outer edge. This causes the outer edge to have more tension—that is, it is strained, but yet not altered in shape. So it is with a steel saw-plate. The tension in the rim is covered by hammering the saw-plate near the center, but not enough to alter the shape of the center or edge, either one, yet the tension or strain is in the edge, and when the strain or tension is increased by speed and labor, the plate still remains true.

Suppose this center hammering should be carried far enough, the center then drops through like an oil-can bottom where this over-strain is made to serve as a spring to eject the oil from the can. In a saw this condition is analogous to a tire-bound wagon-wheel. The hub huckles through because the rim is strained by the center bearing greater than can be retained in a true plane. This tension or strain in a wagon-wheel is made to serve a useful purpose—to hold the wheel dished so as to resist the outward push of the axle-tree when the load on it inclines that way. Now, if you were to hammer the tire of the wheel, the hammering would stretch it and make it larger, so the tension would be removed to the extent of the hammering.

The same rule holds good in sawplate. If the saw is actually rim-bound—that is, if the edge is too small for the center—it should be hammered on the edge to remove the tension somewhat. Now, if you should run your saw fast enough, this rim-bound condition would cease while the certain rate of speed was kept up, and vice versa. If the saw is center-bound and rim large, the center is expanded by hammering to meet the large edge or rim. It must be borne in mind that when the edge is too large and the saw is center-bound, the speed makes matters worse, and your saw then runs snaky or Virginia-rail-fence style, reverse curves in the cut.

This subject of tension is not fully understood by the best saw-makers in the United States. One of them wrote me that he thought the cause of the croaking of the saw-plate in cold weather was due to hammering the center open too much, that it caused the edge to be strained, etc. That was true when the plate was at rest, but, when under speed, it was not, for the strain or tension was removed. If this had anything to do with breaking at all, it was because the center was not expanded enough, for I have tried it out and out. I find that for cold weather a saw must be hammered more open than in warm weather to avoid breaking. *O. E. Grandy in Industrial American.*

THE LATEST ARMOR-PLATE TESTS, now in progress by the government engineers at Annapolis, will probably prove one of the most important ever made, and has already resulted in showing the superiority over all others of the American nickel plate made by the Harvey process at the Government works at Bethlehem. By this process the face of the plate is so treated as to harden it several inches deep, leaving the remainder in its original condition. It is intended to secure the same result that was sought after in the compound plate—a hard face having a tough back. The object is to keep out or break up the projectile on the out-

side, while the tough back holds the whole plate together. Secretary Tracy, who was present at the time, with many other government officials and army officers, expressed himself as highly pleased with the result of the trials. He especially remarked that they showed the high efficiency to which American skill had reached in this important direction, and added that American manufacturers had nothing to fear from any competition abroad. These experiments were made October 31st. They were to be renewed about ten days later, and will probably be completed ere these lines meet the eyes of our readers.

The Elastic Limit.

The opinion has at various times been emitted that straining a metal beyond its elastic limit injures it, but this appears to be untrue. It is not the mere straining of a metal beyond one elastic limit that injures it, but the straining, many times repeated, beyond its two elastic limits. Sir Benjamin Baker has shown that in bending a shell plate for a boiler the metal is necessarily strained beyond its elastic limit, so that stresses of as much as seven to 12 tons per square inch may obtain in it, as it comes from the rolls, and unless the plate is annealed these stresses will still exist after it has been built into the boiler. In such a case, however, when exposed to the additional stress due to the pressure inside the boiler, the over-strained portions of the plate will relieve themselves by stretching and taking a permanent set, so that probably after a year's working very little difference could be detected in the stresses in a plate built into the boiler as it came from the bending rolls, and in one which had been annealed, before riveting into place, and the first, in spite of its having been strained beyond its elastic limits, and not subsequently annealed, would be as strong as the other.

As another instance of the ideas very commonly prevailing, we may note that objection has been raised to the theory of wire gun construction in that it depends upon the assumption that the wire is not strained beyond its elastic limit, and that, as in the very process of being wound in place the wire must of necessity take a permanent set, the foundations of the theory are unstable, and that hence all the algebraic formulae for the tension of the wire are useless. This objection does not seem to us well founded. No doubt if the wire is wound on to the gun from another roller it is permanently deformed in the process, and owing to its elasticity, stresses of the nature of those due to bending will exist in it after being wound into place, and thus the ring tension will not be uniformly distributed over the section of the wire. As this wire is thin, however, these stresses should not be high, and as, moreover, the overstrained portions will be able to relieve themselves by a plastic yielding, if necessary, thus transferring part of their load to the neighboring understrained fibers, while the mean tension remains the same, there is no reason for supposing that this unequal distribution of stress over the section of the wire seriously affects the application of the formulas, or the validity of the theory on which these formulas are based. The conditions indeed are much the same as in the case of the boiler shell plate discussed above, and as experience proves that such boilers can be constructed successfully without annealing these plates, our conclusions as to the wire gun may be said to be confirmed by experience. The real objection to wire guns appears to be the want of longitudinal stiffness resulting in drooping of the muzzle, but this is a question not entering into the scope of this article.—*Engineering.*

THE TOOL AND HANDLE IN ONE PIECE.—The difficulty in making an effective, strong joint between a tool and its handle has long been felt, and the disadvantages thus involved are well understood, not only in respect to looseness in the joint but to the positive lack of power. But the invention of the Mannesmann process, for the production of tubes direct from metal blocks, would now appear to have rendered both possible and desirable the making of a tool combined with its handle; that is, by means of that process tubes are produced having solid portions at one or more points of their lengths, and these tubular rods may be made in any convenient lengths, with solid portions at regular or irregular distances apart, so that by cutting through such solid portions the rod can, of course, be divided up to a corresponding number of blanks for tools. By cutting such bars through at convenient points, as the size or length will show to be best, each section will consist of a hollow part, which may be suitably shaped or bent to form the handle, and the solid part, which can be shaped into the tool-head by forging or stamping. Various tools are so formed, and it is obvious that they possess a greater degree of strength and durability than tools of which the handles form a separate piece.

THE HOLDING POWER OF ANCHORS.—Extensive experiments are being carried out in England to determine the holding power of different kinds of anchors, and the experiments are to be made for the purpose of finding out which is best.

As manganese in cast iron increases beyond 50 per cent, the mass cracks in cooling; and when it approaches 93 per cent, the mass crumbles or falls to pieces.

SCIENTIFIC PROGRESS.

Lime, Limestone and Mortars.

With regard to the burning of limestone or carbonate of lime, pure carbonate of lime may be subjected to the intense heat of the oxyhydrogen blowpipe without losing its power of slaking when exposed to moist air, a fact but too well known to all who use the lime light. Even natural limestones of considerable purity, writes Walter F. Reid, can be exposed to the highest available temperatures without deterioration of the resulting hydrate; and I have myself exposed Buxton limestone to the intense white heat of a steel furnace, and subsequently found it to slake as well as the same stone burnt in the ordinary way. Should any of the limestone be insufficiently burnt, i. e., should it still retain its carbonic acid, it will not slake, and the lumps can easily be separated from that which has been converted into a fine powder by the slaking process. The use of wood for burning lime has the great advantage that it does not introduce the deleterious sulphur compounds present in all mineral fuels.

The interesting experiments of Wolters and other observers have clearly proved that the presence of carbonic acid is not necessary for the setting of mortars, and that mortars will set perfectly well in an atmosphere quite free from carbonic acid. No doubt the ultimate hardness of mortars is much increased by the gradual absorption of carbonic acid; but the process is extremely slow, and as it requires several generations for its completion, we must not rely on it for modern work.

Dr. Zurek found a considerable percentage of caustic lime 500 years old, and a sample of mortar from a bridge over the Great Western railway, which was removed last April, and was about 50 years old, still contained 27 per cent of the lime in a caustic state. Air slaked lime does not absorb carbonic acid unless free water is present; this has been known for 20 years, and yet some persons specify that lime shall be newly slaked.

This is in direct contradiction, both to the practice of the ancients and modern scientific observation.

There is a reason for the use of pulverized marble. Marble, even the finest particles, is crystalline in structure; and it is a fact well known to chemists, that a particle of crystalline substance will often produce crystallization when added to a mass of identical chemical composition, but amorphous in structure. It is, therefore, highly probable that the presence of these crystalline particles in mortar may cause the carbonate of lime, which is slowly formed, to assume the crystalline structure; and as this is the final and most permanent form of all mineral substances, the result is no doubt favorable as regards the permanence of the mortar.

With regard to the admixture of the glue with whitening, this could hardly be very desirable, but caustic lime would have a very different chemical action on the glue. I have used for many years for painting woodwork, out of doors, a mixture of blood and caustic lime, which mixture is much more desirable than a wash of lime or even Portland cement; and yet the blood alone is a very unstable substance.—*World's Progress.*

Insolubility of Pure Metals in Acids.

The results of an investigation concerning the cause of the insolubility of pure metals in acids are contributed by Dr. Weeren to the current number of the *Berichte*. De la Rive, so long ago as the year 1830, pointed out that chemically pure zinc is almost perfectly insoluble in dilute sulphuric acid. Dr. Weeren's theory of the phenomenon is as follows:

"Chemically pure zinc, and also many other metals in a state of purity, are insoluble in acids, because, at the moment of their introduction into the acid, they become surrounded by an atmosphere of condensed hydrogen, which, under normal circumstances, effectually protects the metal from further attack on the part of the acid."

The experiments from which this theory has been derived were briefly as follows: The amount of chemically pure zinc dissolved by the acid was first determined. It was next sought to determine what difference would be effected by performing the experiment *in vacuo*, when of course the escape of the hydrogen would be greatly facilitated. The solubility was found under these circumstances to be increased sevenfold. Next, the experiment was performed at the boiling temperature of the dilute acid, first when ebullition was prevented by increasing the pressure, and secondly when ebullition was unhindered. In the first case, when ebullition was prevented, the solubility was practically the same as in the cold; while in the second case, with uninterrupted ebullition, the solubility was increased 24 times. Finally, experiments were made to ascertain the effect of introducing into the acid a small quantity of an oxidizing agent, capable of converting the hydrogen film to water. When a little chromic acid was thus introduced the solubility was increased 175 times, and when hydrogen peroxide was employed the solubility was increased three hundredfold. The explanation of the ease with which the metal becomes attacked when the ordinary impurities are present, is that the hydrogen is not then liberated upon the surface of the zinc, but rather

ther upon the more electro-negative impurities, leaving the pure zinc itself open to the continued attack of the acid.

WEATHER SIGNS.—The formula of popular weather signs most approved by scientific men is that adopted by the farmers' Club of the American Institute some years ago: 1. When the temperature falls suddenly, a storm is forming south of you. 2. When the temperature rises suddenly, a storm is forming north of you. 3. The wind always blows from a region of fair weather toward a region where a storm is forming. 4. Cirrus clouds (curl-cloud, cat-tail) always move from a storm region toward a region of fair weather. 5. Cumulus clouds (hay-cook) always move from a region where a storm is forming. 6. When cirrus clouds are moving rapidly from the north or northeast, there will be rain within 24 hours, no matter how cold it is. 7. When cirrus clouds are moving rapidly from the south or southeast, there will be a cold hailstorm on the morrow, if it be in the summer, and if it be in the winter, there will be a snowstorm. 8. The wind always blows in a circle around a storm, and when it blows from the north the heaviest rain is east of you; if from the south, the heaviest is west; if from the east, the heaviest is south. 9. The wind never blows unless rain or snow is falling within 1000 miles of you. 10. Whenever heavy white frost occurs, a storm is forming within 1000 miles north or northwest of you. This is about as far as popular weather prophecy has yet advanced. It is not a great distance, but it is better than the old fashion of trusting to the italic warnings in the almanac, prepared a twelvemonth ahead. While clouds, especially the higher forms, have a general tendency to move in the same direction as storms, that is, from west to east, it has been decided that they are a very poor guide to follow in special instances, and they fail, especially at times when such assistance is the most needed.

COMPOSITION OF THE SUN.—Thousands of curious and ingenious theories have been brought forth to account for the fact that the sun, although he has whirled his burning disk across the heavens for untold ages, continues to burn without being consumed or his bulk being lessened in the least. Some learned men affect to believe that the great orb is a monstrous ball of gas, but even a great ball of gas would be consumed in its utmost atom in the course of a few thousand years. Others pretend to believe that its fires are kept up by the remains of wrecked worlds which are constantly falling into its depths, but even this seems far from probable, not to say a purely absurd conclusion. In giving his opinion on the last contention, one of the most eminent astronomers of the day has figured that a mountain range consisting of 176 Ohio miles, falling into the sun, would only be sufficient to maintain the present heat for a single second; a mass equal to that of our earth would engender only enough of heat to last 93 years. If these conclusions are correct, and we have no means of proving them false, well may we ask the question: Of what wonderful, indestructible substance is the sun composed?—*Boston Journal of Commerce.*

HAILSTORMS AND FORESTS.—A curious observation regarding hailstorms has been brought before the Swiss Geographical Society at Geneva by Herr Riniker, the chief forester of Aargau Canton. He maintains that hailstorms do not occur where there are forests, and cites the case of a small chain of mountains in the south Aargau, known as the "Lindenberg," which, in their normal state, are completely covered with trees. About 25 years ago, the forest was felled in two places, leaving wide gaps across the valleys and over the range and immediately afterward the valleys were visited by devastating hailstorms. Five or six years later the larger of the two gaps was planted with fir, and since that time not a single hailstorm has been reported in that portion of the range, or in the valley below, while further up, in the neighborhood of the other gap in the forest, they still occur every year. The Government is now considering the advisability of closing the gap and letting "Nature take its course."

POSSIBLE BIRTH OF THE MOON.—When the earth was young, says Dr. Baily, astronomer royal for Ireland, it spun round at such a rate that the day was only three hours long. The earth was liquid then, and as it revolved at that fearful speed the sun caused ever increasing tides upon its surface until at last it burst in two. The smaller part became the moon, which has been going around the earth ever since at an increasing distance. The influence of the moon now raises tides on the earth, and while there was any liquid to operate on in the moon, the earth heaped up much greater lunar tides.

A DANGEROUS LOCALITY.—There is a post at the corner of the public square in Fairmont, Mo., which gets a bolt of lightning from nearly every thunder storm that comes along. Three men, five horses, and 20 or 30 sheep have been electrocuted at the spot.

THE APPARENT FLATTENING OF THE VAULT OF THE HEAVENS has been found to have an annual period, and to depend on clouds. It seems least flat with a misty horizon, and less by night than by day.

ELECTRICITY.

Progress in Electric Street Railroads.

In Oakland, work is to be commenced within a few weeks on the electric road to run from Sixteenth and Grove streets, along Sixteenth street to Paralta, up Paralta to Seventeenth, and down Seventeenth to the Sixteenth street depot. This is the West Oakland branch of the Oakland Consolidated Street Railway Company. The contract for filling in a portion of marsh land on this road has already been let.

The Proposed Road from San Francisco to Half Moon Bay

Seems to be now in a fair way for realization. The Supervisors of San Mateo county granted the franchise some two weeks since. The franchise stipulates that the road shall be one section from Colma to Half Moon Bay. Work is to be commenced within six months and \$20,000 must be expended in work the first year. The road is to be completed inside of three years and cars running into Half Moon Bay, otherwise all work done on the road, together with material in use, to be forfeited to the county. The conditions in regard to the service of the proposed road are that cars shall be run every 60 minutes or oftener; fare from Half Moon Bay to San Francisco, 65 cents; freight, exclusive of butter, eggs, milk, etc., \$1.65 per ton from this side of the San Pedro, and \$1 from the other side. The company has 60 days option to accept the franchise on these conditions.

The San Mateo and San Francisco Road.

If no unforeseen delay intervenes, the running of cars on the line of the San Francisco and San Mateo Railway will begin on January 1st next. Track-laying over the entire route, from the foot of Market street to Baden, in this county, is finished, and all switches and crossings are in place, except that at Ocean View, which will be completed next week. The overhead wire, which will extend over the length of each track, is now being placed in position. The company has two sizes of cars, one style being 24 feet in length over all, and the other 30 feet. The middle portion of each style is the same. The motive power will be generated by two engines of 500-horse power each, and one of 250 horse power. All the engines are finished and awaiting the completion of the power-house.

The Haywards Electric Road.

This company has let the contract for a power-house, all the ties and poles have been purchased, plans for the machinery prepared, and contracts let for engines, boilers, etc. The power-house will be on the Warner tract, between Oakland and San Leandro. The delay in commencing the road has been caused by a difficulty in carrying out the negotiations for the rails. When they receive the rails work will commence.

Electric Street-Car Lines in Fresno.

The extensive system for street electric roads in Fresno seems to be rapidly taking shape. The local capitalists of that city are furthering the enterprise. The project contemplates about 12 miles of track, with many branches and feeders.

Electric Street Railroads for Walla Walla.

It is expected that Walla Walla's horse cars will soon be changed into an electric line, though whether the system adopted will be that of the trolley or overhead-wire system or some of the underground systems is not yet known. Superintendent Hill of the present-horse car system, is now in the East studying the various systems employed there. He is inclined toward the Woods system, which does away with the expensive overhead wire, and at the same time furnishes a system that can be cheaply put in operation, and is reasonably inexpensive to operate and perfectly safe in operation.

This New System

Is quite novel, and, if found practicable, will no doubt attract much attention. It employs a buried wire, a small exposure being made every six feet. The wire can be laid without disturbing an existing track, even the ties being unmolested. The cars gain power from the buried wire through small exposures, by means of long brushes, which are situated beneath the cars. By this means the entire wire, except the small portion beneath the traveling car, is dead and harmless. It is said that this system is very successful in actual operation. While he is East, Mr. Hill will pay particular attention to its workings, and if he finds it feasible, his street-car company will probably change this line immediately. His report will be looked for with much interest.

A Los Angeles Electric Road.

The Los Angeles Express says that the electric road on the Vernon route is now running cars from First and San Pedro streets through. In a few days the company will open the Los Angeles street line from San Pedro street to Aliso street. It is the intention of the company to connect this line with the East Los Angeles line when it is built, and trains will run from the East Los Angeles Park through to the Santa Fe track on Central avenue, a distance of over eight miles. The contract for the East Los Angeles division has been advertised, and will soon be let to contractors.

New Electrical Appliances.

Among the new applications of electricity noticed the past week, we have a device for an electric signal to prevent accidents to workmen engaged in repairing railroads, which consists of a portable electric battery, to which is connected a bell for giving notice of approaching trains. A soleplate and spring is attached to the side of the rail and the spring is depressed by the flanges of the passing wheels, closing the circuit and ringing the bell. As the workmen continue their work the wire is run out, so that it is possible to get everything from the track before the train reaches the spot. The inventor refuses to patent the invention, being desirous of having it universally adopted by the railroads of the world.

We have also a self-registering electrometer, operated by a photographic process, the invention of a San Francisco electrician. The instrument—without going into description—is an adjustment of the galvanometer to the camera. The needle of the galvanometer responds to the strength of the current, and its fluctuations from moment to moment vary with the amount of current used. As it is not practicable to have some one stand and record the needle's movements, this automatic arrangement has been made to keep a continuous and permanent record thereof. A sheet of sensitized paper slowly unrolls behind the needle, and the action of the light thereon, as shaded by the needle in its different inclinations, gives an accurate registration of its deviations, which represent the variations of the electrical current. Of course a register of this kind has to be kept always in a bright light, or the photographic process would not work.

An automatic telephone check is another valuable application of electricity. The present system of charges for the use of telephones by annual subscription is by many considered unjust, inasmuch as some subscribers speak often and much, whereas others use the telephone only occasionally. A device has been put in practice in Germany by which an electrically driven clock is attached to each telephone, which will work as long as the telephone is off the hook, and stops directly it is replaced. The service is charged for according to time recorded. It is claimed for this system that unnecessary conversations are prevented, that those that take place are limited to reasonable length, and the useful efficiency of the whole installation is increased.

Electric Lights.

The electric lights in Salinas were started up Sunday evening, Nov. 1st, but on account of the unsatisfactory working of the machinery, the lights were not up to the standard. The next night, however, everything was working finely, and the lamps showed a test of 10 per cent above the requirements. The arc system, supplemented by the incandescents, gives to Salinas a metropolitan air.—*Salinas Journal*.

The people of both Ukiah and Healdsburg are congratulating themselves on the immediate prospects of securing electric-light plants for each of these thriving towns. The Ukiah Democrat says that preliminary arrangements have already been made for a plant for that town. Two dynamos have been ordered and are on the way there. The power will probably be furnished either by the flour mill or the grist mill. The people of Ukiah are glad to see the work commence, and the indications are now all favorable for the town soon being lighted in a modern manner.

The Enterprise of Healdsburg says that Messrs. Gardner & Davidson have been in town interviewing the people with the idea of putting in an electric-light plant. The rates offered are reasonable, and it is to be hoped that sufficient patronage may be guaranteed to induce them to put a plant in. Electric lights are a great benefit to a city, and Healdsburg should secure them.

ENLARGEMENT OF THE HAYWARDS ELECTRIC-LIGHT PLANT.—The Haywards Journal says: A visit to the new quarters of our electric light company is well worth the trouble of our people. The new building, constructed of corrugated iron, is 70x32. The manner everything is finished inside and the way everything is arranged shows that the projectors had made a study of the improvements contemplated. We doubt if there is such a fine plant in the State. The power is generated by a new 175-horse power engine. The light is produced by two incandescent machines, each of 500 lights. The capacity of the plant is now three times its former size, and they can run three times as many lights as at present used, and also furnish the power for an electric road to Roberts' Landing. The cost of the new improvements was at least \$10,000.

LARGE DEMAND FOR ELECTRIC MINING MACHINERY.—A single electric machine manufacturing company in Pittsburgh has on hand at present orders enough to keep its works running full all through the fall and winter. The company is shipping its patent electric mining machines into Iowa, Missouri, Illinois, Colorado, Utah and Washington, and will shortly have completed a couple of machines for a mine in West Virginia. F. M. Lechner, the inventor and superintendent of the company, has recently made valuable improvements in electric mining machinery.

GOOD HEALTH.

Fish as Brain Food.

A writer in *Temple Bar*, an English publication, says: As a result of personal experience, I may state that some years since I lived for a period of 40 days, so far as what is called solid food is concerned, solely on fish, with, of course the addition of bread (no potatoes were eaten during the period); but I cannot recommend that mode of living. I discovered before the 40 days had expired that fish was not the stuff of life.

In the course of my experiment, I not only lost flesh, but also energy; nor did I feel my head clearer, or my thoughts and feelings more alert, than when subsisting on more varied food. While living upon fish only, one feels "a want," a craving for "something—you don't know what;" that is to say, you cannot give a name to your desires; nor does the feeling wear off as you continue the dietary; at all events, in my case, "custom came to the rescue;" so, after 40 days had expired, I returned to the flesh-pots, not all at once, though, being convinced that caution was necessary.

One popular fallacy in connection with fish may be noticed; namely, the oft-repeated assertion that the eating of that particular food increases brain-power. No one who has studied the subject can possibly believe the assertion. A man might eat a huge portion of fish every day of his life, and on the day of his death, if the quantity of phosphorus (the brain invigorator) consumed were to become visible, it would not amount to more than might probably suffice to tip a couple of loafers methebes. Communities have existed that lived almost solely on fish, but these lobythophagists were certainly not famous for intellectual attainments. Nor are our fisher villages, in many of which much fish is presumably consumed, the seats of any great amount of brain-power. None of our fisher-folks are remarkable for genius, or even what is called common sense; their views of life and its responsibilities being shrouded in a haze of superstition, which they lack sufficient strength of mind to see through.

No fishing community, so far as is known to the writer, has given to the world a great man. Men of mark—poets, preachers, lawyers, warriors, philosophers and physicians—have emanated, in Scotland at any rate, from all classes except the fishing class.

TERIBLE SLAVERY OF THE CIGARETTE HABIT.—I never fully appreciated the evil effects of the cigarette habit until a day or two ago, when I was called in to draw up the will of a man who won't live many days longer. The man who sent for me is a well-to-do merchant, who will leave behind something like \$200,000 when he goes. He has a son of 30 who is a confirmed cigarette fiend. The old gentleman told me that his son often smoked 100 cigarettes a day, and would not give up the practice, although his father offered him \$100,000 if he would do so. Under the will I drew up, he will get just 100 cents, if he ever lives to get that. He is the most wretched specimen of manhood I have ever seen, and is a man wasting away as rapidly as it is possible for a man to grow thin. He still keeps up an enormous consumption of the little paper cigars, and it is pitiful to hear him confess his lack of will-power. He knows what his father has done with his money, but doesn't seem to care. A legal friend of mine told me of another case of the same kind. An old lady of 70, who lives on Long Island, cut off her son with a few shillings for the very same reason. This young man consumes ten packages of cigarettes a day. A girl he wanted to marry refused him on that account, and now his mother will give her money to somebody else. He is indifferent to both actions, and still smokes cigarettes. He'll die soon, too.—*N. Y. Globe-Democrat*.

SUGGESTIONS ABOUT REST.—Dr. William A. Hammond makes some suggestions in the *North American Review* about how to rest, in which he intimates that change is only partial rest, and that the varying of occupations of the mind as the farmer rotates his crops will be advantageous, but allowing the mind to lie fallow occasionally, like the field, much better. "Men and women, like the fields of the earth, require change, and, like them, they require rest," says Dr. Hammond, with considerable pertinency; but he adds that "these objects can never be attained in the way that the average American sets out to get them." There is altogether too much truth in this comment. The idea of rest which the average American possesses is to pack a trunk and satchel in haste, jump on a train and jolt across half the continent, to stay a day or two at some fashionable resort and then jolt home again. There is change enough in such a jaunt, but no rest. If Horace Greeley were alive, he would tell the listening world that the way to rest is to rest. Dr. Hammond should have put it just that way, but he didn't.

THE FUEL OF THE FUTURE is a subject that is receiving a marked degree of attention, and from present indications it cannot be long before gas will entirely supersede solid fuel for household use in all situations where gas can be had.

TO POLISH DEER HORNS.—Scrub them with a brush and sand to take off the dirt and loose fiber, then polish with rouge and rotten stone and a cloth, and varnish with copal varnish.

USEFUL INFORMATION.

Color Testing of Flours.

The British National Association of Millers, at their recent annual convention, had the good fortune to hear an excellent paper on "The Investigation of the Color of Flour," by Mr. Joseph Lovibond, Mayor of Salisbury, but better known as the inventor of an instrument for accurately measuring and registering the color of flours, which he calls a tintometer.

Mr. Lovibond remarks that when a beam of light impinges on flour, a portion of the light is absorbed by the flour, and a portion only of the rays which constituted the impinging light being reflected to the eye, the color of the flour is really the color of the broken light which reaches the eye, and the particular color is dependent on the preponderance of certain color rays in the reflected light. This fact, as it possibly may have occurred to some of us, makes all the difference in the appearance of a flour, when shown respectively by a miller's traveler, who knows his business, and one who does not. In addition to peering the proffered sample on blue paper, a lot of difference can be made by a little manipulation according to surrounding objects.

In employing the well-known Pekar test, by which the flour is pressed and then dipped in water, the difference of pressure, time and method of immersion in water, the time of exposure before examining, and the dryness of the atmosphere during exposure, all have an influence on the character of the color developed. As uniformity is therefore necessary, the flour could conveniently be always pressed into half its original bulk, should be immersed and withdrawn four times, occupying a total of eight seconds; should then be placed obliquely, so as to drain for 30 minutes before examining. Where the extreme accuracy necessary in keeping a record of colors was not required, it would be found sufficient to take but ordinary care, and to examine when dry, on the next morning. Flours on being kept, bleach.

The color of a flour does not depend on the starch, but on the gluten; color should, therefore, indicate the quantity and also quality of the latter, and thereby be relied upon to show the market value of a flour to a much greater extent than the inexperienced observer usually attaches to it. With a little experience we should be able to anticipate by means of the color of flour, more than the color of the bread. We know that it is not always the whitest flour that makes the whitest bread, but although we know we must have strength in a flour so as to make it carry its color into the bread, we do not always take the different degrees and character of color to be a sufficiently good criterion of strength and other qualities.

VARIOUS USES OF EGGS.—It is an error to suppose that eggs have no considerable use except for food. They are employed in calico printing, in photography, in gilding, in clarifying various liquors and in bookbinding. A large business has sprung up in the preparation of photographic paper with selted albumen, and one establishment alone is said to have made more than two million eggs in six months for this purpose. Many attempts have been made to find a vegetable or animal substitute for albumen, but in vain. A prize of \$2000, offered 30 years ago by an English society for the discovery of a material or process of replacing albumen in calico printing, still remains untaken. Nor are the yolks of eggs used in manufacturing, wholly wasted. They are also employed in the arts, and a manufacturer in Vienna solidifies them. Possibly, too, the development in canning will before long give us canned eggs, or perhaps condensed eggs, suitable at least for cooking. At any rate, it would seem worth while to raise part of the eggs which are consumed by other countries.—*Bradstreet's*.

TO MAKE SKELETON LEAVES, soak in rain water for some weeks, remove by floating upon a card, and very gently remove upper skin, with a soft camel's hair brush. Float in water and catch on a card with the other side uppermost, and remove other skin and pulp. A stiff brush may be needed, to be used by dabbing. Do not touch with finger. Finally wash well, bleach with javelle water, wash and dry.

AVERAGE PRICE OF WAGES.—Based upon the estimates furnished by the superintendent of the census bureau, the average wages of laborers in the manufacturing industries of the United States are a few cents less than \$411 each. Taking into consideration the large proportion of women, children and unskilled that are employed, and this is not a very bad showing for American labor.

Numerous experiments have demonstrated that iron or steel, when magnetized, undergoes a change in form caused in the magnetic conditions of the molecules, which causes their elongation or contraction.

GRAVEL WALKS in gardens and shaded places are frequently covered with an unsightly growth of moss. This can be effectually prevented by watering the walks with a solution of sulphate of copper (blue vitriol).

When Herschel studied astronomy only four double stars were known. Now nearly 7,000 of them are distinguishable.



A. T. DEWEY.

W. B. EWER.

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SAN FRANCISCO:

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Business Announcements.

[NEW THIS ISSUE.]

Assessment Notice—California Cr-amery Company.
Assessment Notice—Grangeville Vineyard Company.

See Advertising Columns.

Passing Events.

The Mining Congress is now in session in Denver, and a brief report of the preliminary proceedings is published in another column. Fuller reports will follow. A number of delegates have gone on from this State to represent our interests.

A Miners' Convention is proposed in this State, the main object of which will be an interchange of views as to the best method of bringing about a resumption of hydraulic mining. Placer county is taking the lead in the initiatory steps. Congress is to be memorialized as to the needed legislation.

Were coal ordinarily as abundant in San Francisco as at the present time, our manufacturing interests would greatly increase in number and extent. The greatest drawback locally, to manufacturing industries is lack of good, cheap fuel.

The American Society of Mechanical Engineers, now in session in New York, has decided to hold its May meeting in this city. The local mechanical engineers are making preparations to receive and entertain the visitors.

The International League of Press Clubs will meet in this city in January next. The San Francisco Press Club will entertain the visitors.

Business Outlook.

As the year draws to a close, evidence is not wanting to confirm the prevailing opinion that the incoming year will be the most prosperous that has been enjoyed for years past. This opinion is grounded on the good crops secured and good prices realized by California farmers, together with more attention being given to mining.

Taking the crops in the rough and estimating the money received for them at the average prices for the season, and we obtain the following: For wheat, \$45,000,000; barley, \$10,000,000; other cereals, \$5,000,000; hay, \$12,000,000; potatoes, onions and other vegetables, \$4,500,000; beans, \$1,000,000; total, \$77,500,000. To this can be added at least \$3,500,000 for butter, cheese, eggs, etc., making a grand total of \$81,000,000.

Turning to fruit, we find the returns are very large. They are estimated as follows: Citrus and deciduous marketed green, \$4,500,000, marketed dried, \$5,000,000; raisins \$4,000,000; canned fruits \$3,500,000. Total, \$17,000,000, and when to this is added wine and brandy the aggregate will go well into \$20,000,000.

With the money returns from farm products going over \$100,000,000, we begin to realize that we have entered on a season of unexampled prosperity, for with so much money disbursed for products that have given good profits, money will not only be easy but seeking new avenues for employment.

The good results of large crops and profitable sales are witnessed in renewed railroad construction in various parts of the State, and also in more general activity among iron-workers than has been reported for some time. The activity among iron-workers and machinists, in general, is largely stimulated by the low prices ruling for iron and coal, which places them on more of an even footing with similar industries at the East, which admits of their successful bidding for work. The industry is also deriving considerable more business from the mining industry on this coast, which appears to be coming prominently to the front by reason of more money, both foreign and domestic, seeking investment in quartz mines.

The Mechanical Engineers.

The American Society of Mechanical Engineers, on Monday decided at its meeting in New York to convene in San Francisco next May. A local committee has been at work some weeks in expectation of this decision, and a dispatch of welcome has been forwarded to the Society in New York, assuring the members of the necessary arrangements being made here.

The American Society of Mechanical Engineers is growing at a very rapid rate. Its first catalogue, issued in 1880, showed a total membership of 189, and it has grown since that date at an average rate of about 100 members per year, so that its total membership is now over 1200, over 1000 of whom are regular members, and the others honorary, associate or junior members. Members are all elected by letter ballot, after having been recommended by five proposers or secondors, and their letters of recommendation scrutinized by the council. Seven black balls in the letter ballots are sufficient to exclude a candidate. The society is making efforts to extinguish the indebtedness on its building, No. 12 West Thirty-first street, New York, and a circular letter was recently sent to all the members asking how they would vote on the question of increasing the dues from \$10, the present figure, to \$15 per year. The replies were eight to one in favor of the proposed increase, which indicates that the membership consider that they are getting more than the worth of their annual dues in the benefits received from membership. A letter ballot has just been sent out containing the names of 62 candidates for full membership and 27 for junior membership. Among the candidates for full membership were three distinguished mechanical engineers of this city. It is expected that Irving M. Scott will be elected vice-president at the present session.

We published two weeks ago the names of the local committee in this city. At the meeting on Wednesday, Mr. W. R. Eckert presided and Mr. C. G. Yale (of the MINING AND SCIENTIFIC PRESS) acted as Secretary. The chairman and the president of the Technical Society, Mr.

Jno. Richards, are to select a Finance and Executive Committee, who are in turn to select the sub-committee to perfect the arrangements for the entertainment of the society, when it visits San Francisco.

Now that the society has decided to come, those in this city interested in mechanical engineering will have to take an active interest in the matter. A number have already signified their willingness to co-operate, but there are many others who have as yet made no response. The committee will make a thorough canvass for funds and lay out a plan by which whatever there is of interest may be seen by the visitors. On the way it is expected they will stop at Virginia City, but most of the time will be spent in the vicinity of San Francisco.

Electric Lights for the Eternal City.

A late English paper furnishes an account of an electric plant recently installed near Rome, Italy, which is of interest in this country, as showing the endorsement given by foreign engineers to one of our most prominent California inventions—the Pelton water-wheel—as well as their confidence in the high voltage method of electric transmission, now being so successfully demonstrated at the Frankfort Exposition.

One of the finest examples in Europe of water-power utilization in connection with alternating currents is the new electric station now being established at Tivoli, near Rome. As is well known, there is at this place a large and valuable water-power, a portion of which has recently been utilized in the establishment of a large alternating current station of a capacity of 2000-horse power intended to supply a portion of the city of Rome with electric light.

Water is taken from the Falls of Tivoli by an aqueduct from which a pipe-line 1.6 of a meter, 62 inches in diameter is run to the wheel station. The entire fall is 48 meters, 156 feet, and the water supply 3 cubic meters, 106 cubic feet per second. The power station consists of three 100-horse power Pelton wheels which operate direct current dynamos used as exciters, also six Pelton wheels coupled direct to the same number of 350-horse power alternators which run at 5000 volts pressure and 45 amperes.

The wheels are governed by hydraulic inlet valves, which are worked by a sensitive hydraulic relay set in operation by a centrifugal governor. By this means the speed is automatically kept constant independent of the working of the machine.

The alternating current so generated is to be transmitted to Rome, a distance of 25 kilometers—15½ miles—by means of four-stranded copper cables, each being 100 square millimeters—15 square inches—in cross-section, and capable of carrying 120 amperes carried overhead on iron poles placed 35 meters—114 feet—apart, and about 30 feet high, insulated by means of double-shed oil insulators specially designed for this work by Professor Mengarini.

A drop of 1000 volts, or 20 per cent, is to be allowed in these lines. At the far end of the trunk mains the pressure will be reduced by step-down transformers to 2000 volts, and distributed underground by Siemens cables to secondary centers, at which it will again be reduced to 100 volts. The six machines are all capable of being worked together in parallel, the maximum number of five being used together, one machine being always in reserve. Two of the exciters are sufficient to supply exciting current to the whole of the dynamos, the third being a reserve.

It is stated that Senator Stanford has decided to erect a handsome suburban hotel building, to cost over \$100,000, near the main entrance to the grounds of the Leland Stanford Jr. University at Palo Alto, Santa Clara county.

The Sacramento county supervisors, who visited Iowa Hill, Placer Co., to see if it were advisable to let the miners there clean up bed rock, have decided that they have no power to grant the permission asked.

ALUMINIUM.—A consignment of some 300 pounds of bar aluminium has just arrived in this city from Germany, and may be seen at the office of Wm. Lichtenburg, 321 Market St.

Copper.

There is to be noted a great increase in the demand for electrolytic copper, with the active extension of electric lighting and railways, both here and abroad. During the past month there has also been a revival in the demand for sulphate of copper, which had remained dormant for the previous six months, during which most of the foreign works have been closed in consequence of the very large stocks carried over from last year, when the selling price left a very large profit on its manufacture, causing an excessive production. To this cause is largely due the excessive deliveries of copper last year and the falling off this year. The estimated production of 1890 in England and on the continent was 75,000 tons of sulphate, but it will probably not amount to 15,000 tons in all this year. This difference of 60,000 tons represents reduced deliveries of 15,000 tons of copper in those markets this year.

James Lewis & Sons of Liverpool, in their report on copper for the month, say: "An arrangement between the chief American mining companies, now represented by five or six different individuals or firms, for the regulation of their production in accordance with the home and European consumption, appears very probable. It is at last recognized that producers outside of the United States need not be considered, as higher or lower prices are found by experience to have little or no effect upon the extent of their production, which continues very much the same whether copper is at £40 or £60 per ton. Such action would be very beneficial to smelters and manufacturers, as it would give steadiness to values and largely stop speculation in this metal which so disorganizes the trade—generally for stock exchange purposes.

The Messrs. Lewis consider that the recent fall in values of copper seem in no way justified by the actual position of the metal. In March last, before the Anaconda mine was closed, the stock of copper in England and France was 57,381 tons and the value about £52 10s., while the present stock is 51,381 and the value £46 5s. per ton. In addition to this, the stock in the United States is stated to be reduced fully one-half.

New Gold-Saving Apparatus.

John H. Hohart of this city has patented through the MINING AND SCIENTIFIC PRESS Patent Agency a novel arrangement of amalgamating or copper plates intended more particularly for saving float gold, but adapted for ordinary gold-saving. The arrangement is such that barriers or impediments are formed in the course of the pulp, causing a whirling or adding of the flowing material, very advantageous for the catching of the precious particles.

The tailings with water are passed from the feed-chute into a hopper and fall through a screen on to an amalgamating plate, where some of the gold is caught. The sluice is set at an angle of about 45 degrees, and within this is a series of copper plates. These extend across the sluice transversely, and meet its bottom at an angle, said plates, on account of the inclination of the sluice, being approximately on a horizontal plane, or having a slight rise therefrom. They extend upwardly toward the cover of the sluice, but terminate short thereof, leaving a space above. A series of amalgamating plates are placed above these other plates, extending along the top of the sluice, while the lower portion extends downward across the sluice. Along the bottom of the sluice is another series of plates.

The tailings (or pulp), after passing into the sluice, meet the first inclined plate, are checked in their rapid flow and directed upwardly and outwardly against the upper side of the other copper plate. At this point, in trying to pass around the upper end of the plate, a whirl or eddy is created throwing the precious particles in perfect contact with the plates. This goes on through the whole series where the same action takes place. Baffle plates and guard plates are suitably placed to prevent injury to the amalgamating plates, and there is a transverse V-slucio at the end of the main sluice to catch any particles of quicksilver.

WHEN Herschel studied astronomy only four double stars were known. Now nearly 7,000 of them are distinguishable.

Hydraulic Hauling Machine.

This machine is the invention of Mr. W. Barton, mining manager of the North Bend and Barton Company, Ballarat, at which mine it has been successfully worked for some time. The cost of the present machine, inclusive of a steel wire rope, and erection of same, is £35. The cost of sinking 100 feet with machine, was £2 11s. 7d. per foot. The cost of sinking 100 feet with the windlass and manual labor, was £4 14s. 9d. per foot. Both tests were made through the same character of country by the same men, using the same blasting material, viz., "rack-a-rook," both done by wages men at 8s. 4d. per shift of six hours. The saving to

rate of 300 feet per minute. The machine is capable of being made to lift 2000 pounds at an increased pressure. For shaft sinking, an ordinary pressure of 100 to 200 feet head of water is sufficient to raise 320 pounds to 640 pounds respectively. The main feature of this machine is its safety, it being impossible to overwind with it. Its steadiness and silent action are improvements on the air winch, besides a saving of 50 per cent in cost over same, not to mention the cost of the generality of air.

Blasting in Coal.

No question connected with the actual working of mines is deserving of more atten-

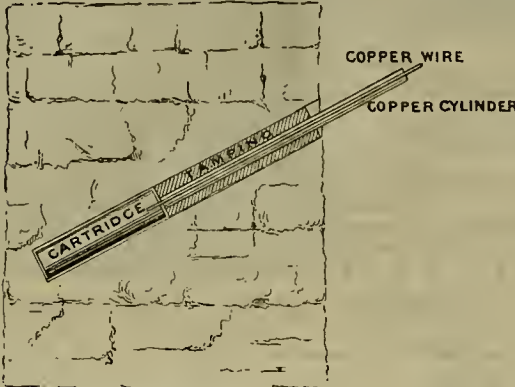
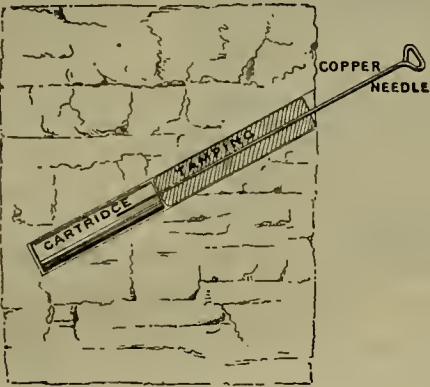
also five new batteries, with a combined capacity of 10,000 horse power. The engine specially designed for the new mill is a very powerful condensing Corliss.

The Mining Congress in Session.

Most of the delegates from this State to the Mining Congress at Denver went on last week. The following were the delegates appointed by the Governor: J. Garvey, San Diego; J. W. Conant and Wm. P. Milter, Shasta; W. K. Addeley, Napa; H. H. Boomer, San Francisco; J. Niles Searle, Nevada City; C. E. Clinch, Grass Valley; R. McMurray, San Juan; Mellville Attwood, Nevada County, and Wm. Ire-

of peace? Why should times be worse than at any other time in the century? The want of money was the cause.

Secretary Sherman, the Senator said, after a visit to England and a conference with the goldbugs, had returned home and surreptitiously incorporated in a bill a clause rejecting silver. If this had been done to gold, it would not be worth 25 cents on the dollar. If it was not used for money, it would have no commercial value. But silver was universally circulated. It could not be destroyed, but it could be depreciated. There was no surplus bullion in the world previous to 1890. The entire product was used for commercial purposes. Great Britain was constantly selling silver short. The interest payments of that nation were \$80,000,000 annually, and were derived from the sale of silver. When silver went up last year, England sold twice as much as the requirements of the nation demanded, and they would do this so long as silver remained a commodity. He protested against the long dollar. The country was being robbed, the middleman was growing rich, and the producer growing poorer. Because they made a long dollar, enough dollars couldn't be found to pay debts; hence stagnation and hard times.



Needle System

Barrel System

NEEDLE AND BARREL METHODS OF BLASTING IN COAL.

the company in wages alone has amounted to several hundreds of pounds, due principally to the rapidity of hauling by the machine. Inasmuch as the men are able to get the debris and water away quicker, they have more time for boring. The water used by the machine is conserved in a dam 100 feet above the level the machine worked, and conducted down to the motor, through 3 inch pipes in the pump shaft, the company having no pumps. Mr. Barton states that any company with pumps in their shaft may obtain, by inserting a 2-inch pipe in column at the level where the machine is set, all the power they require at less expense than where a dam has to be used.

Hydraulic winch consists of a working drum 20 inches diameter, 14 inches wide, the lower or power drum 8 inches diameter, 16 inches

tion than that of the different methods adopted in blasting. The systems invented for charging and firing holes, having for their objects a certainty of explosion and diminution of danger, are of special interest to the working miner. In the coal mines of Illinois and other Central States, two methods of blasting are commonly practiced, one known as the needle method and the other as the barrel method. The needle method is the one prescribed by law in Illinois, but despite this, the barrel method is largely used, by reason of several advantages. The latter requires less time and less skill than the needle method. The two methods of loading the holes are plainly illustrated in the accompanying sketches.

IMPORTANT MINING DECISION.—In the case of the Waterloo Mining Company, grantee of

lan Jr. and F. M. Pixley, delegate at large. For San Francisco Mayor Sanderson has named as representatives William Ireland Jr., Ross E. Browne, Louis Janin, A. J. Bowle, T. C. Howell, A. B. Paul and John Finlay. Mr. Attwood was unable to attend.

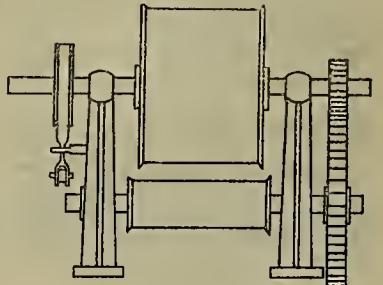
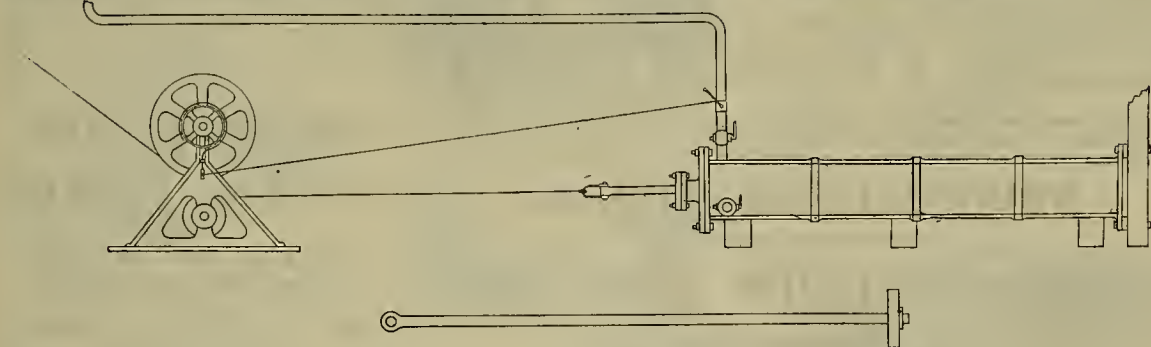
The Congress opened on Wednesday of this week, when the El Dorado Mining Stock Exchange was dedicated. There was a street parade in which the miners and all interested in mining took part. There were also floats bearing mining machinery in motion and a great many tableaux indicative of the important features of mining. At the dedication speeches were made by President Taylor of the Mining Exchange, Mayor Rogers of Denver, and others. All the speakers advocated the free and unlimited coinage of silver.

Our Coal Supply.

For once our local markets are overtaken with coal, and many thousand more tons are on the way. The arrival of the grain fleet, nearly all coal laden, to this port has brought in an immense quantity.

The abundant supplies of foreign and domestic coal in this port have had the effect of sending freight for coasting coaliers down too low to make voyage payable, and as a result many vessels that have engaged in this trade will have to go to Oakland creek for a while. It was the foreign shipments that did the crowding, causing the price of coal to elude and the Coast mines to restrict their output. All varieties of coal are cheaper at present than they have been for a long time.

Up to the end of October, the total deliveries of coal in port were 1,133,120 tons, as against 833,820 tons at a corresponding period last year. Of this, 41,000 tons came from Australia and 44,200 tons from British Columbia. The low freights at present ruling for cargoes of coal from Coast mines have had the effect of putting the steamers Haytian Republic and Lakme into grain-hauling purview from Oregon to this port. Coal freights have dropped 50



PATENT HYDRAULIC HAULING MACHINE.

wide, driving wheels geared 5½ to 1 being equal to 13½ powers, two cast-iron stands 3 feet high to carry same. There is also a compound lever brake attached to same 12 inches diameter; this is used only in case of accident. The motor for working same consists of an ordinary barrel 9 feet in length, 11½ inches diameter, with a cover and stuffing-box at one end only. Power taken in by the ordinary tap, and reversed by the lower or untied tap. The piston-rod is composed of 2-inch iron turned up, 11 feet long, with hole in end to take shackle. The piston is formed of two separate castings, the lower form to hold the bucket being turned up in the lathe; the upper form keeps the leather in position. The whole is held together by a 1½-inch nut. The cost of bucket leather is 1s. per week. The hauling was done previously by a ½ inch Lowmoor iron cable; but this has been changed for a steel wire rope, six strands, 19 wires to each strand; total draught strain at 43 pounds to square inch, 4429 pounds, capable of lifting 320 pounds a distance of 120 feet in height at the

the Silver King Quartz Company, entry for which was made by Charles F. Bradley and others against John S. Doe, the Secretary of the Interior has affirmed the decision of the Commissioner of the General Land Office against the protestants who claimed that the mine was merely an extension from the vein or ledge of the Silver King mine. The claim in controversy was located in the Calico mining district, San Bernardino county, by J. J. Alleen, and after several transfers finally conveyed to Doe.

A CABLE FOR MISSION STREET.—Secretary J. L. Willontt of the City Railroad Company, which is a branch of the Market street system, announces that the horse-car line on Mission street from the ferry to the terminus will be changed to a cable road next year. The work of digging a cable trench has been begun at the easterly end of the line.

IMPROVING THE PLANT.—The Pacific Rolling Mills has recently put up a hydraulic mill that will roll beams of steel up to 20 inches square,

In the afternoon the Mining Congress opened at the People's Theater with ex-Governor Tabor in the chair. Delegates from 33 States and Territories reported, and it was understood that Hon. Niles Searles, formerly Chief Justice of California, would be elected permanent chairman. The recommendation has not yet been reported.

The greater part of the session was occupied by Senator Stewart of Nevada, who delivered a long address upon the silver question. He urged the Congress to adopt resolutions that would compel the National House of Representatives to pass laws restoring silver to a parity with gold. Resolutions favoring the coinage of the American product only, the Senator said, would not obtain 20 votes in the assembly. The gold ring has repudiated silver, and they have reduced the value of commercial paper to the narrow limits of gold. As a consequence, the farmers are growing poorer, and the history of bank failures showed their circulation was not enough to keep the banks in reserve funds. Why should there be hard times with 20 years

cents per ton within the last month and are now below \$2, at which figure even steamers of enormous capacity can do little more than pay expenses.

At present prices, it is said that the Southern Pacific Co. finds it cheaper to buy coal than to mine it, and if the railroad coal steamers tie up on this account, the outlook for freighters with over 47,000 tons of coal afloat and to arrive from Newcastle, Australia, alone, is not very bright. However, this great supply of cheap coal is good for manufacturers and domestic consumers, whatever may be the prospects for the dealers.

MINERS' HOSPITAL.—The preliminary arrangements have been completed for a Miners' Home, or hospital, at Shasta. The scheme originated with Dr. Stevenson, so we understand, and will be conducted on the same plan as the railroad hospital at Sacramento. Every miner or millman who will contribute \$1 per month will be entitled to attendance at this hospital.

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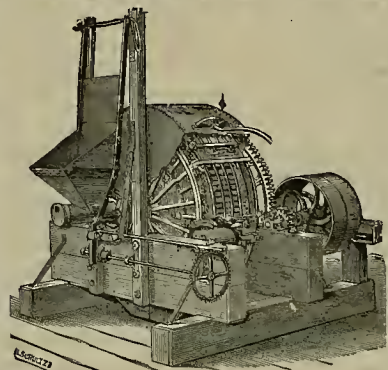
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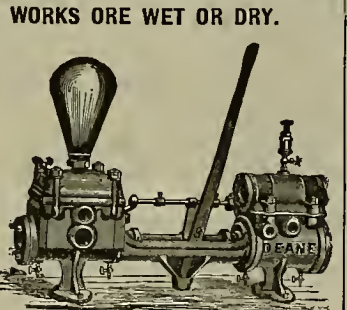
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THE BEST NEWSPAPER published in the district is

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Daily and Weekly edition. Gives all the Mining News, Dealers in Mining Machinery and Mining Supplies will find THE TIDINGS the best medium for directly reaching the owners or managers of mines. Investors in mines will find it to their advantage to subscribe.

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Relorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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BUCKETS,

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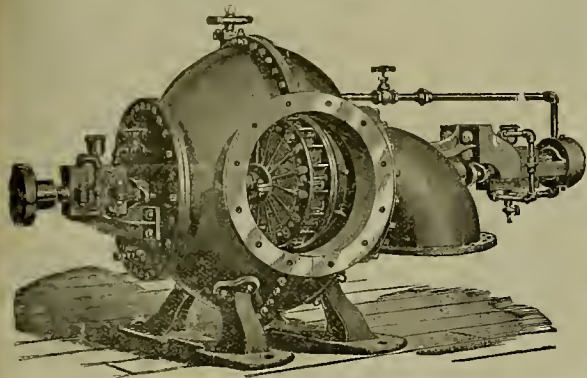
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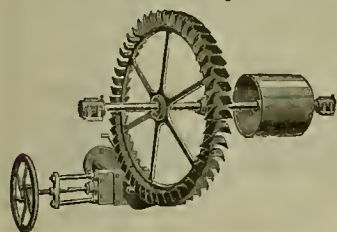


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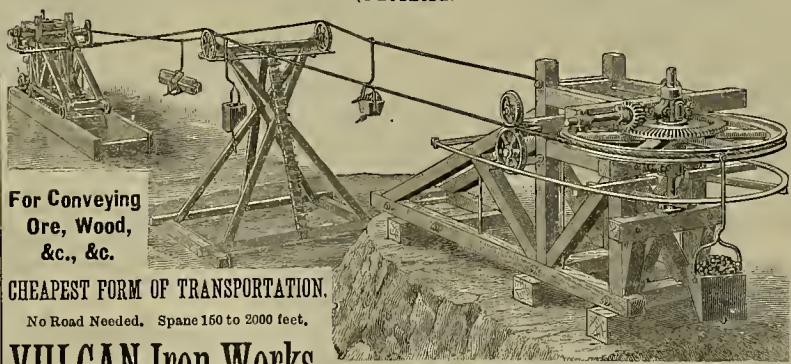
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VULCAN WIRE ROPEWAY.

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
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SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.
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GOLD AND SILVER REFINERY
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Experimental machinery and all kinds of models, Tin
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 19, 1891.

Business continues fairly active. The backwardness of the rainy season is generally accepted as favorable to a large seedling and a good crop season. Money, while in fair demand, is by no means working close. Large disbursements are being steadily made on wheat and other farm products. It now looks as if the usual annual settlements will be made this year with more ease than for several years past. Late mail advices received from New York are as follows:

After temporary stringency caused by the shipment of several million dollars to Boston, money is easier, sterling exchange is reduced, railroad earnings reflect the large amount of grain in transit, of which further evidence is had in the advanced lake rates from Chicago to Buffalo, and additional amounts of gold were ordered from Europe. The total gold imports since Sept. 12 have been \$23,900,000, and about \$2,000,000 is known to be on the way. From Jan. 1 to Nov. 7 the exports of gold amounted to \$75,823,584, and the imports to \$24,935,643.

Another indication of much significance is the revived export movement of cereals, and this, despite higher prices in this market and advanced ocean freights. A leading grain firm reports large purchases at primary and seaboard markets. European buyers continue taking freight room for months ahead. It is reported their charters for the coming four months for all kinds of grain equal nearly 70,000,000 bushels.

MEXICAN DOLLARS—The last outgoing steamer for China took out \$423,225 for Hongkong and \$60,000 for Yokohama. The market hangs around about 74 1/2 cts.

QUICKSILVER—Receipts the past week aggregate 243 flasks. Shipments overland in last month aggregate 100 flasks. For the first ten months of the calendar year receipts at this point aggregate 11,680 flasks, while the shipments by sea aggregate 3888 flasks. The market holds strong at pool quotations.

SILVER—The address of St. Johns in favor of the free coinage of silver at the Bankers' Convention held at New Orleans, and the letter of Secretary Foster on the silver problem, written to same convention, and his addresses on the same subject before the New York Chamber of Commerce, are forcing the question to the front. The Mining Congress in session at Denver will also discuss the present situation. Notwithstanding the general discussion and apparently more favorable consideration of silver, there is a growing belief that we will not secure free coinage legislation until after the next Presidential election. Those in position to know say that there is a powerful monied clique at the East and abroad that is making a strong fight against bimetalism owing to the present position of silver being more favorable to speculation than if the metal was placed on the same footing with gold.

BORAX—Overland shipments in last month aggregate 440,770 cts. The market is steady at pool quotations.

LIME—Receipts the past week aggregate 2778 hhls. The market is quiet but steady.

ANTIMONY—The market is quiet but firm.

LEAD—The market at the East, after passing through several weeks of strong depression, appears to be gaining in activity, with better prices obtainable. In our market, trading is dull but steady.

TIN—The local market is very dull, with prices favoring buyers. The consumption this year was disappointing, owing to fruit-canners not taking as much as was expected. *Iron Age*, Nov. 18, reports the New York market as follows: Estimates of spot stocks of pig vary considerably, some placing the total at less than 1700 tons and others making it upward of 2000 tons. That the holdings are weighty there is no doubt, however, and so strong is the conviction that 2000 tons does not overestimate the quantity that some operators still refrain from covering the November "puts." The consumptive and trade demand is merely fair and met at prices very close to those that figure in the speculative dealings. Tin plate is dull and heavy. London cables, Nov. 18th, report an inactive market for both pig and plate.

COPPER—The market continues to settle. London cables report that weak holders are about closed out. New York mail advices to Nov. 12, report as follows: Returns from 14 Lake Superior mines show an increase of over 4000 tons in the output during the past ten months; Montana is said to make a pseudo phenomenal showing also, and the uncertainty as to what Anaconda may do serves to complicate matters. Meanwhile home consumers manifest what may be termed supreme indifference and the situation in Europe is by no means assuring.

IRON—The market shows a fairly firm tone under a free consumption, and it being reported that the free imports are cared for. English advices report a steady, firm tone, but at the East the market is far from satisfactory to the selling interests.

COAL—Imports the past week aggregate as follows: Baltimore, 3000 tons; Departure Bay, 6543; Newcastle, N. S. W., 11,627; Sydney, 3079; Hull, 1851; Comox, 4530; Cardiff, 3900; Liverpool, 7775; Tacoma, 1900; Seattle, 3555. Total, 47,680 tons. The spot market near by cargoes continue in buyers' favor, but distant cargoes and cargoes for shipment have a firm tone, with prices asked above the parity of this market. The break in charter at this port makes it difficult to secure vessels, except at quite an advance for loading at Australian or English ports for San Francisco or San Diego. It is said that the output of the coast mines is being regulated to suit the demand.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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COMPANY AND LOCATION.		ASSESSMENTS.		SECRETARY.	
Alta M Co., Nevada.....	40.....	Oct 6, Nov 11, Dec 2.....	L Oshorn, 309 Montgomery		
Alpha Cons M Co., Nevada.....	7.....	Nov 4, Dec 9, D. C. 23.....	C E Elliott, 309 Montgomery		
Best & Becher M Co., Nevada.....	50.....	Nov 6, Dec 11, Dec 31.....	C E Elliott, 309 Montgomery		
Bodie Cons M Co., California.....	13.....	Sept 22, Nov 6, Dec 9.....	H D Walker, 309 Montgomery		
Buchanan M Co., Calif. r. n. a.....	16.....	Oct 7, Nov 9, Nov 26.....	P J Sullivan, 121 Post		
Bulwer Cons M Co., California.....	7.....	Oct 28, Dec 4, Dec 31.....	L Oshorn, 309 Montgomery		
California & Arizona M Co., Arizona.....	4.....	Oct 28, Nov 3, Nov 30.....	J E Jewell, 310 Pine		
California Verde Marble Co., California.....	1.....	Nov 4, Dec 7, Dec 23.....	W J Gurnett, 308 Pine		
Chollar M Co., Nevada.....	31.....	Oct 25, Nov 30, Dec 22.....	C E Elliott, 309 Montgomery		
Confidence Silver M Co., Nevada.....	19.....	Nov 17, Dec 22, Jan 11.....	S A Groth, 414 California		
Cons Imperial M Co., Nevada.....	32.....	Sept 23, Nov 2, Nov 23.....	C E Elliott, 309 Montgomery		
Cons New York M Co., Nevada.....	5.....	Sept 23, Nov 3, Nov 30.....	J W Pew, 310 Pine		
Deer Mountain M Co., Nevada.....	5.....	Sept 23, Nov 3, Nov 30.....	J W Pew, 310 Pine		
Eureka Cons M Co., California.....	4.....	Oct 25, Nov 30, Dec 21.....	D M Kent, 330 Pine		
East Best & Belcher Silver M Co., Nevada.....	7.....	Oct 22, Nov 24, Dec 12.....	C H Mason, 331 Montgomery		
Keystone Cons M Co., Nevada.....	25.....	Oct 20, Nov 25, Dec 21.....	L Cassel, 115 Front		
Fall River Cons Gold Quartz M Co., California.....	4.....	Oct 27, Nov 30, Dec 21.....	A W Barrows, 303 California		
Gray Eagle M Co., California.....	99.....	Oct 16, Nov 24, Dec 15.....	A B Thompson, 309 Montgomery		
Hale & Norcross S M Co., Nevada.....	3.....	Nov 12, Dec 18, Jan 11.....	J W Pew, 310 Pine		
Head Centre and Tranquility M Co., Arizona.....	3.....	Oct 30, Dec 1, Dec 22.....	D M Kent, 330 Pine		
Horse-Shoe Bar Cons M Co., California.....	5.....	Oct 24, Oct 1, Dec 22.....	J W Pew, 310 Pine		
Kentucky Cons M Co., California.....	1.....	Sept 6, Oct 21, Nov 23.....	J H Isham, 310 Pine		
Keystone Cons M Co., Nevada.....	25.....	Oct 20, Nov 25, Dec 21.....	L Cassel, 115 Front		
Kingman M Co., Arizona.....	1.....	Sept 30, Oct 12, Dec 1.....	T E Atkinson, 42 Montgomery		
Monro G M Co., California.....	31.....	Sept 17, Oct 27, Nov 30.....	H D Walker, 309 Montgomery		
New El Dorado M Co., California.....	3.....	Oct 19, Nov 23, Dec 1.....	A D Walker, 309 Montgomery		
Occidental Cons M Co., Nevada.....	57.....	Oct 2, Nov 4, Nov 24.....	E B Holmes, 309 Montgomery		
Ophir M Co., Nevada.....	1.....	Nov 5, Dec 5, Dec 28.....	N T Messer, 309 Montgomery		
Peer M Co., Arizona.....	1.....	Oct 13, Nov 23, Dec 21.....	F W Seltz, Forest City		
Pentacostal Gold M Co., California.....	10.....	Oct 13, Nov 23, Dec 21.....	E B Holmes, 309 Montgomery		
Savage M Co., Nevada.....	7.....	Oct 29, D. C. 1, Dec 22.....	E B Holmes, 309 Montgomery		
Seg Belcher & Mides Cons M Co., Nevada.....	5.....	Oct 29, D. C. 1, Dec 22.....	E B Holmes, 309 Montgomery		
Sierra Nevada M Co., Nevada.....	100.....	Oct 6, Nov 11, Dec 1.....	E S Parker, 309 Montgomery		
Silverado M Co., California.....	2.....	Oct 13, Nov 16, Dec 17.....	S E Co, Chronicle Building		
Silver Hill M Co., Nevada.....	29.....	Nov 12, Dec 15, Jan 5.....	D O Bates, 303 Montgomery		
Siskiyou Cons Quicksilver M Co., California.....	13.....	Oct 16, Nov 24, Dec 18.....	A H Fish, 309 Montgomery		
Utah Cons M Co., Nevada.....	1.....	Oct 16, Nov 24, Dec 18.....	A H Fish, 309 Montgomery		

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
E Best & Belcher Silver M Co.....	Annual.....	O H Mason, 331 Montgomery.....	Nov 23
Mexican M Co., Nevada.....	Annual.....	C E Elliott, 309 Montgomery.....	Dec 1
Riverside M & M Co.....	Annual.....	J Stadfield, Jr., 309 Montgomery.....	Nov 30

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Champion M Co.....	10.....	T Wetzel, 320 Sansome.....	Aug 15
Cons Cal & Virginia M Co., Nevada.....	30.....	E W Haver, 309 Montgomery.....	Aug 15
Ophir M Co.....	25.....	E M Hall, 314 Montgomery.....	Sept 10
Eureka Cons M Co., Nevada.....	25.....	101 Sansome St.....	Dec 3
Great Western Quicksilver M Co.....	25.....	A Halsey, 323 Montgomery.....	Oct 1
Idaho M Co., Grass Valley.....	3.....	Grass Valley.....	Aug 4
Meyflower Gravel M Co., California.....	1.....	Oct 1, 330 Pine.....	Aug 20
Pacific Coast Bldg Co., California.....	1.....	A H Clough, 230 Montgomery.....	Nov 10
Standard Cons M Co., California.....	10.....	J W Pew, 310 Pine.....	Oct 26

San Francisco Metal and Coal Market.

THURSDAY, November 19, 1891.

ANTIMONY.		STEEL.	
Per lb.....	@ 14	English, D.....	16 @ 20
Redford, in car lots 8 @		Canton tool.....	9 @
Powdered, do 8 @		8 1/2" Diam tool.....	9 @ 10
Concentrated, do 7 1/2 @		Pick & Hammer.....	9 @ 9
All grades jobbing at advance.		Machinery.....	4 @ 5
		Toe Calk.....	1 1/2 @
BORAX.		TIN PLATE.	
Bolt.....	@ 22	B. V. steel grade.....	@ 21
Sheathing.....	@ 22	14x20, spot.....	6 25 @
Ingot, jobbing.....	@ 15	Tharcoal, 14x20, 6 00 @	
Do, wholesale.....	@ 15	Do, roofing, 14x20.....	6 00 @
Fire Box Sheet.....	@ 22	Do, do, 24x36.....	12 00 @
		Pig tin, spot, 1/2 lb.....	@ 21
Bar, base.....	@ 3	Irreg. iron, nom'l.....	@ 21
Norway, base.....	@ 4		
COAL.		IRON.	
Spot Lead.....	@ 75	SPIT FROM.....	@ 75
Eglington 3 ton.....	25 00	Gretta.....	8 00
Glengarnock.....	25 00	Carbon Hill.....	8 00
Am. Soft, No. 1.....	25 00	Nasimino.....	8 00
Oregon Pig.....	30 00	Gilman.....	7 00
Puget Sound.....	30 00	Seattle.....	7 00
Olay Lane White.....	24 00	Coos Bay.....	6 00
Shotts, No. 1.....	25 00	Channel.....	9 50
Essex, base.....	25 00	Chambersland, in sacks.....	14 00
Thorncliffe.....	25 00	Do, bulk.....	13 00
Gartsherrrie.....	25 00	Wall end.....	9 00
Sarrow.....	23 00	Scotch Split.....	9 00
Carroll.....	23 00	Strymon.....	8 50
CHROME IRON ORE.		West Hartley.....	8 00
Per ton.....	@ 10		
LEAD.		COKE.	
Pig.....	@ 45	Austridian.....	@ 12
Bar.....	@ 51	Liverpool Steam.....	@ 10
Sheet.....	@ 74	Scotch Split.....	@ 10
Pipe.....	@ 64	Cardiff.....	@ 7 25
		Lehigh Lump.....	@ 13 00
(Discount 10% on 500 bags)		Cumberland.....	@ 10 00
Drop, 3/4 bag.....	@ 2 10	Egg, base.....	@ 11 00
Buck, 3/4 bag.....	@ 2 10	West Hartley.....	@ 7 50
Chilled, do.....	@ 2 30		
QUICKSILVER.		COKE.	
By the old.....	@ 47 50	English, to load.....	@ 11 00
Flasks, old.....	@ 40	Do, spot, in bulk, 12 00 @	
		Do, in sacks.....	@ 15 00

Eastern Metal Markets.

By Telegraph.

New York, November 18.—The following are the closing prices the past week:

Silver in Silver	London	New York	Copper	Lead	Tin.
Thursday.....	43 1/2	94 1/2	11 35	4 15	20 05
Friday.....	43 1/2	94 1/2	11 30	4 15	20 05
Saturday.....	43 1/2	94 1/2	11 25	4 15	20 05
Sunday.....	43 1/2	94 1/2	11 15	4 15	19 95
Tuesday.....	43 1/2	94 1/2	11 25	4 20	19 90
Wednesday.....	43 1/2	94 1/2	11 20	4 35	19 90

Borax is steady at pool quotations. Quicksilver is firm. Unchanged quotations. Tin is strong at a slight advance. Lead is higher and stronger. Copper is weak and unsettled.

Sales at San Francisco Stock Exchange.

THURSDAY, November 19, 9:30 A. M.		100	
100 Alpha Con.....	45c	100 Hale & Norcross.....	1.50
1900 Alpha.....	1.00 @ 1.05	20 Julia.....	.15c
100 Andes.....	.65c	700 Justice.....	.55 @ .6c
200 Baltimore.....	.10c	400 Mexican.....	.25 @ .45
150 Bodie.....	.85	200 Occidental.....	.80c
100 Best & Belcher.....	3.50	300 Ophir.....	3.55
100 Bojle.....	.65c	250 Overman.....	1.50
300 Challenge.....	1.70	200 Pearl.....	.15c
500 Chollar.....	1.10	400 Sierra Nevada.....	.50c
200 Cons Cal & Va.....	5.12 @ 5.15	400 Silver King.....	.90c
100 Cons New York.....	.35c	50 Union Con.....	.25
100 Crown Point.....	1.35	100 Utah.....	.70c
100 Echu.....	.70c	450 Yellow Jacket.....	1.80
100 Gould & Curry.....	1.50		

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

BACK FILES OF THE MINING AND SCIENTIFIC PRESS (unbound) can be had for \$5 per volume of six months. Per year (two volumes) \$8. Inserted in Dewey's patent binder, 50 cents additional per volume.

Assessment Notices.

GRANVILLE VINEYARD COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Hanford, Tulare County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of November, 1891, an assessment, No. 4, of \$4.00 per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 11th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors. CHAS. MERSELDER, Secretary. Office, 111 Front Street, San Francisco, California.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1891, an assessment (No. 1) of One (1) Cent per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 308 Pine Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 21st day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors. W. J. GURNETT, Secretary. Office, 308 Pine Street, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 27th day of October, 1891, an assessment, No. 25, of Four (4) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 21st day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors. A. W. BARROWS, Secretary. Office, Room 11, No. 303 California Street, San Francisco, California.

CALIFORNIA CREAMERY COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Novato, Marin County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 24 day of November, 1891, an assessment, No. 1, of Forty (40) Dollars per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 11th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors. CHAS. MERSELDER, Secretary. Office, 111 Front Street, San Francisco, California.

DELINQUENT SALE NOTICE.

NEW EL DORADO GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California. Notice—There are delinquent upon the following described stock, on account of assessment (No. 3) levied on the 2d day of October, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
J. L. Wilbert.....	93	5	\$ 25
J. L. Wilbert.....	99	5	25
J. L. Wilbert.....	100	5	25
J. L. Wilbert.....	102	25	1 25
J. L. Wilbert.....	106	15	75
W. N. Martin.....	118	100	5 00
W. N. Martin.....	119	100	5 00
W. N. Martin.....	146	800	40 00
W. N. Martin, Trustee.....	154	1,000	50 00

And in accordance with law, and an order from the Board of Directors, made on the 2d day of October, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California, on FRIDAY, the 27th day of November, 1891, at the hour of one o'clock p. m. of said day, to pay said Delinquent Assessments thereon, together with costs of advertising and expenses of sale. J. W. PEW, Secretary. Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

DELINQUENT NOTICE.

CALIFORNIA AND ARIZONA MINING COMPANY. Location of principal place of business, San Francisco, California. Notice—There are delinquent upon the following described stock, on account of assessment, No. 4, levied on the 29th day of September, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
William Wiggins.....	37	3750	\$75 00
Marion Corcoran.....	51	1,250	125 00

And in accordance with law, and an order of the Board of Directors, made on the 29th day of September, 1891, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the Company's office, No. 330 Pine Street, Room 4, on MONDAY, the 30th day of November, 1891, at the hour of 12 o'clock noon of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of the sale. T. E. JEWELL, Secretary. Office, 330 Pine Street, Room 4.

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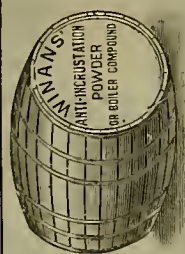
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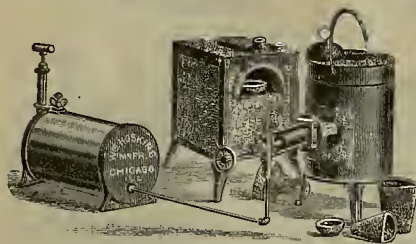
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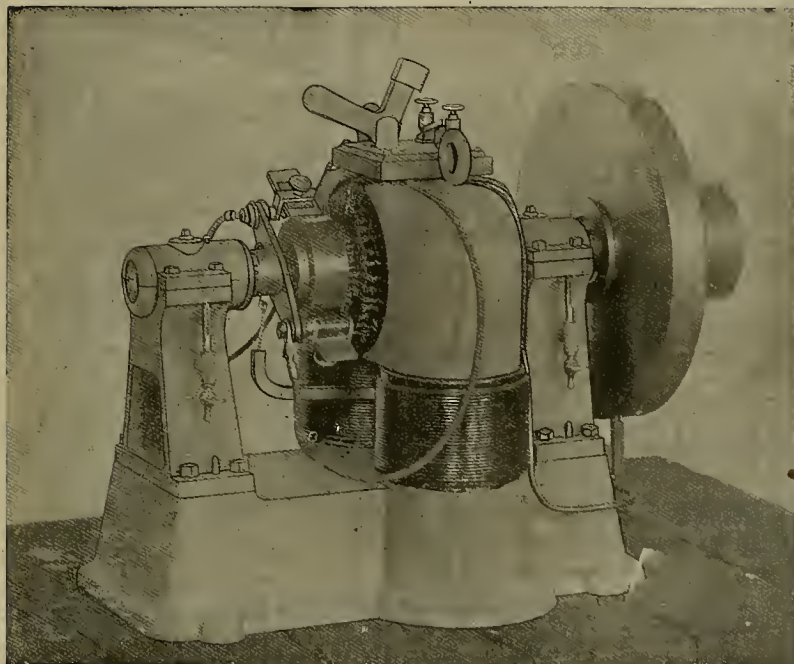
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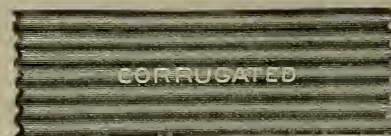
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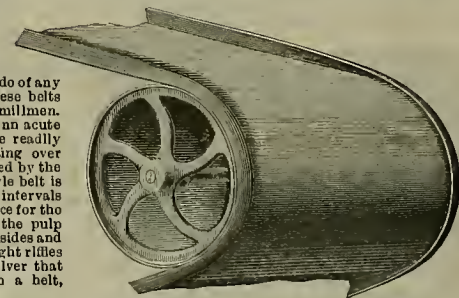
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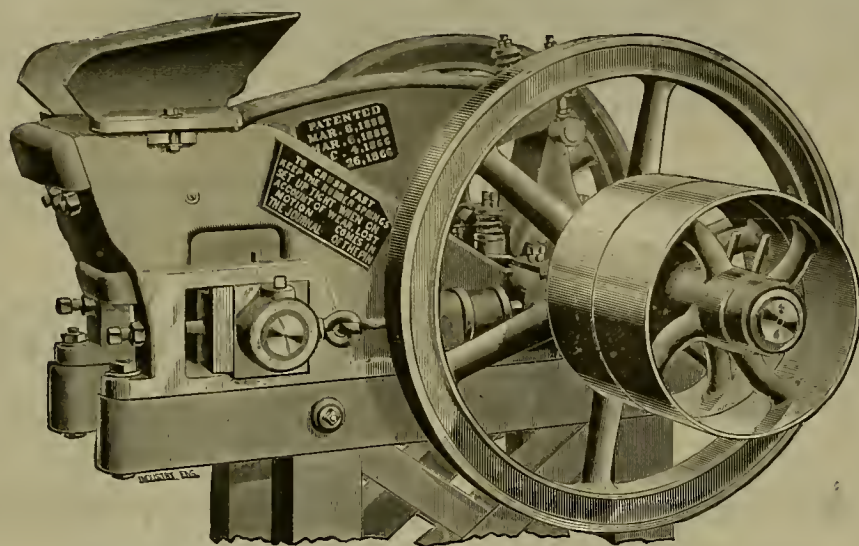
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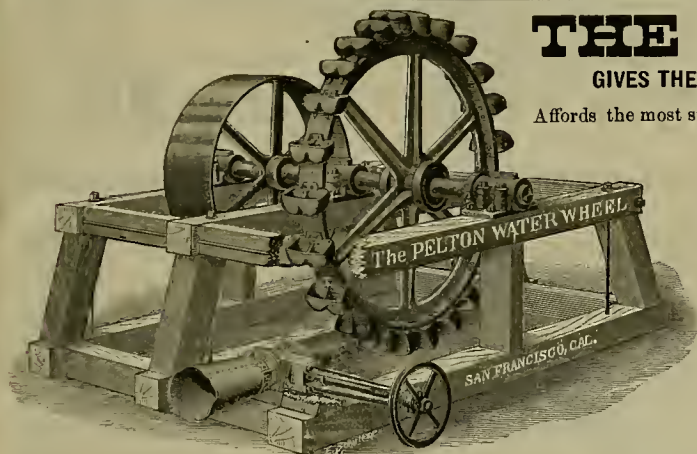
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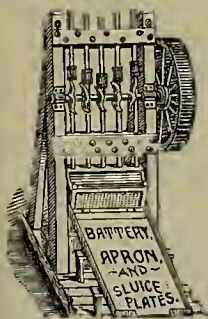
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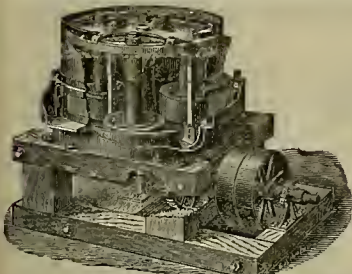
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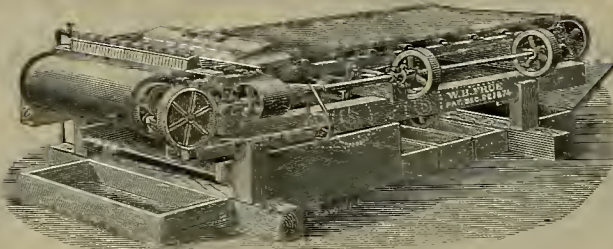
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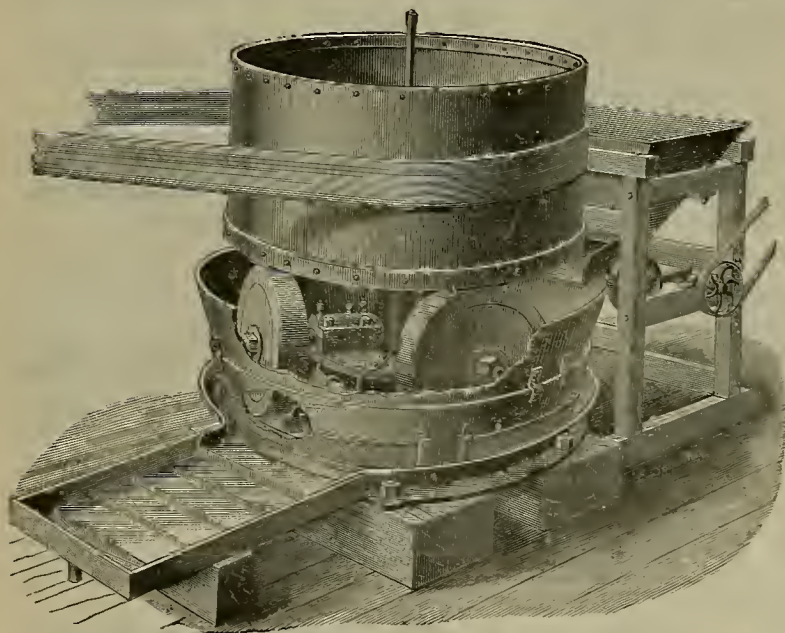
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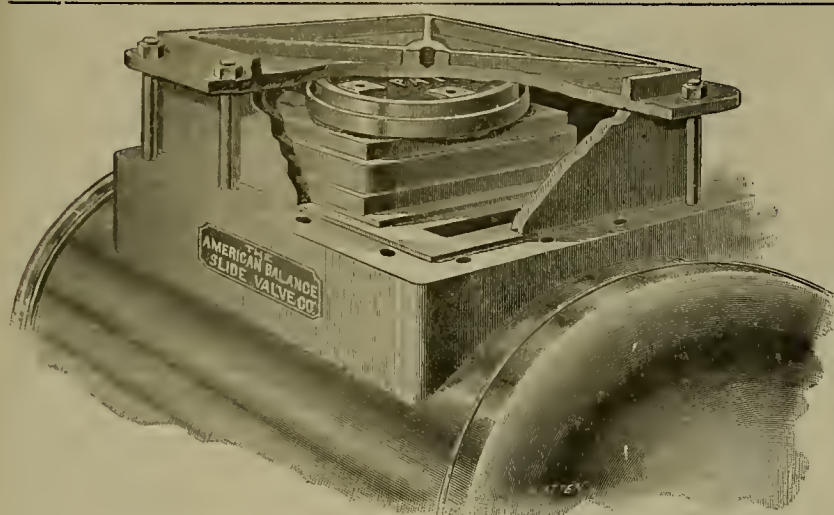
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SAN FRANCISCO, SATURDAY, NOVEMBER 28, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.



AMERICAN BALANCE VALVE FOR LOCOMOTIVES.

The American Balance Slide Valve.

The American balance slide valve is a Pacific Coast invention, and consists simply of two pieces. There is a cast-iron snap ring, with its inner face beveled, to fit over and against a conical disk, which is placed on top of the valve, as shown in the sectional cut; or the conical disk may be cast as part of the valve. When the steam-chest cover is placed in position, it forces the ring down on the beveled face of the disk. This slightly expands the ring. The ring being thus expanded over a cone, is always carried upward and held in working position by its own elasticity.

The two beveled faces, therefore, give to the ring a self-supporting, self-adjusting and self-maintaining feature which entirely dispenses with supporting springs, adjusting screws and all other expensive and troublesome parts. This is of great importance for the utility and

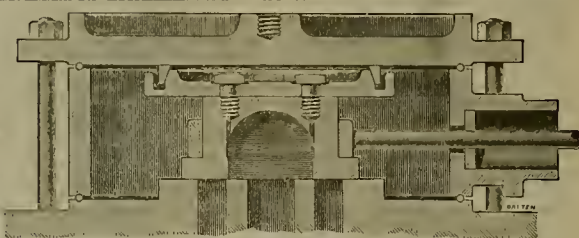
practicability of a balance for slide valves. It is impossible for the ring to stick because of the beveled faces.

There are but two steam joints, one on the beveled face and one on the smooth top surface of the ring. These two joints are kept in perfect condition by the actual operation of the valve and the steam pressure of the chest; this insures long service of the valves without trouble or cost. The balance being circular, permits of any desired area being taken off the valve, two balances being used in place of one,

if necessary. The valve is therefore relieved of all the excessive pressure, leaving only pressure enough to hold it on its seat.

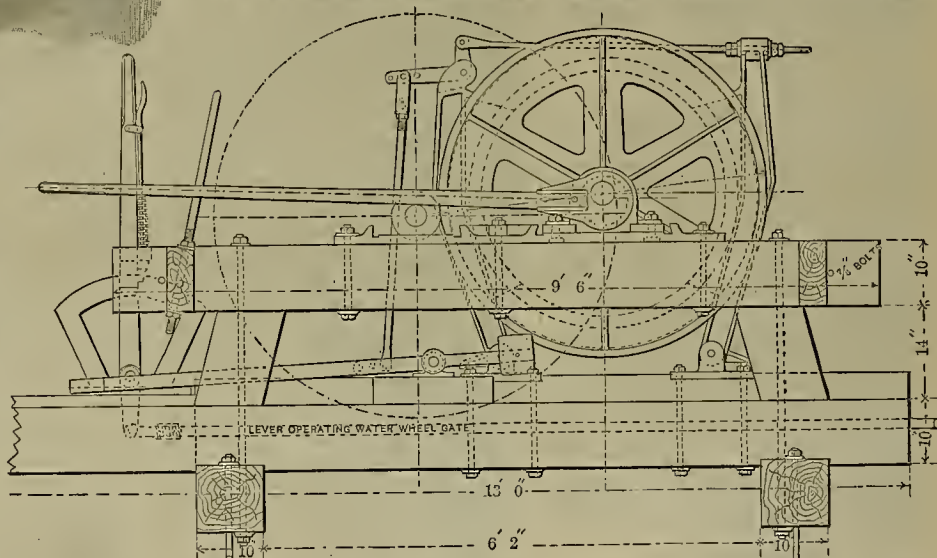
The balance is bolted to the valve by two or four bolts tapped into the valve; it can, therefore, at a trifling cost, be easily applied to old valves now in use—a very important feature to those already having engines.

Small holes are drilled through the bolts to relieve the interior of the disk to the exhaust. This method of relief does away with the necessity of a steam



SECTION OF SLIDE VALVE.

It is also in use on North Pacific Coast, South Pacific Coast, S. F. and North Pacific, the Virginia and Truckee, Carson and Colorado, the Union Pacific, and some of the large Eastern roads; for steamboat use, the California Transportation Co., Sacramento Transportation Co., Merchants' Tugboat Co., and Piper, Adin &



SECTIONAL VIEW OF PELTON WATER WHEEL HOIST.

joint between the bottom of the disk and the top of the valve, as would be required if a relief hole was drilled through them both. No relief valves are necessary in the steam-chest with this balance.

All balances manufactured by the American Balance Slide-Valve Co. contain tough, close-grained iron, and are made to standard gauges. The absence of springs, screws, etc., makes the valve positive in its action; the beveled ring obviates the necessity of any packing. The simplicity of construction, the true principle of self maintenance, the inability to injure it, and the easy adaptation to old as well as new valves, are features which recommend this balance, so that, while on the market here for less than a year, it has been very largely adopted.

For locomotive use it has been adopted by the Southern Pacific Co. as a standard valve.

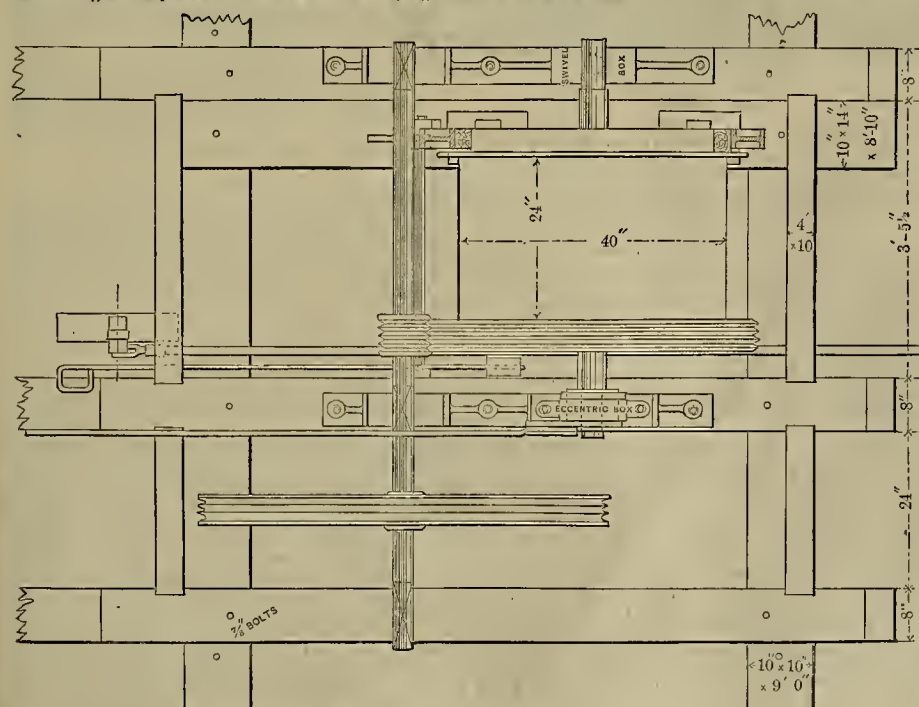
Co. have adopted it. The valve is also used on several steam schooners, and a number of stationary engines in this city and elsewhere on the coast. The balance is made by the American Balance Slide Valve Co., 216 Mission St., San Francisco.

The Pelton Water Wheel Hoist.

The accompanying cuts represent a hoist designed by the Pelton Water Wheel Co. for use in connection with their wheels. The power from the wheel shaft may be transmitted by means of manilla rope or belting. The former, however, is preferable in most cases.

These hoists, as will be observed, are provided with powerful post breaks, affording absolute security in lowering and the friction made to engage by an eccentric box operated by a lever located at any convenient point for the engineer. Where the head admits, the water wheel can be operated direct to the pinion shaft, where the sheave is shown, and thus avoid all intermediate gearing. These hoists are built of any capacity desired and to suit all conditions of service.

The friction may be made either of paper or with V grooves, as shown. For heavy work and operating to a great depth, a geared hoist is used with reversible wheels, designs for which will be hereafter illustrated.



PLAN OF WATER WHEEL HOIST.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Ede.

Mexican Mining Customs.

A Sketch in the District of Guanajuato.

[Written for the Press.]

The mining district of Guanajuato, which is situated less than a day's journey by rail from the city of Mexico, having produced hundreds of millions of dollars since 1522, the greater portion of which was extracted from the ores of the "Veta Madre," has justly earned the reputation of having been one of the greatest lullion producers the world has ever known, having been worked for so many centuries and still producing annually bullion amounting to something in the neighborhood of \$3,500,000 in value, it follows that very rich ore must have been taken out, for the mines have never been worked in that energetic manner so characteristic of mining operations in the United States.

"Peon" labor being so cheap, it becomes a matter of economy to employ it in removing all possible waste from the material hoisted to the surface for subsequent metallurgical treatment.

Enclosure.

A space of several acres around the working shafts and tunnels belonging to mines of greatest magnitude is, as a rule, enclosed by a substantial stone or adobe wall, forming the "planilla," or ore floor, where sorting is carried on.

The space is enclosed to enable a systematic search of all employees leaving the works. A guard is stationed day and night at the doors of the enclosure, challenging all passing through them.

Inside, owing to the actual amount of manual labor being done in separating the ore into piles of varying richness, the scene is a busy one.

Sorting Ores.

There are men, women and children moving about in a rapid way, carrying baskets of ore, sorted and to be sorted, and from different piles on the "planilla" respectively.

There are others squatted in front of small water tanks, each with a little pile of ore to be sorted, engaged in separating into baskets the good from the waste.

Sorting is facilitated by moistening the material, which brings the valuable mineral into greater relief.

The waste which is thrown upon one side is not allowed to remain undisturbed, for the enterprising "Gamboleros," in most cases, enter into a contract with the owners of the mine to remove it from the "planilla" for the privilege of sorting out anything further it may contain.

About the Shaft.

The busiest scene is just about the mouth of the perpendicular shaft. Hoisting is being done, and rapidly, too, for Mexico by a horse-whim or "malacate." Six animals at a lively trot turn the drum around which the cable is being wound; but instead of seeing an iron bucket ascend from the mouth of the shaft, it is a surprise to see a rawhide receptacle, looking very much like an inverted parachute, and carrying a load that would weigh somewhere in the neighborhood of 500 pounds. The whole arrangement is detached from the shaft after being dumped into a car. It is difficult to imagine anything more pliable yet tougher than a water-soaked disk of rawhide. The material hoisted is distributed to different parts of the planilla, according to its nature.

The Water Bucket.

The greatest surprise of all is the water bucket made from two rawhides sewn together. It shapes itself when filled very much like an inverted balloon. It is a revelation to see one of these rawhide tanks hoisted in its immensity when full, but collapsing into a shapeless mass when it is landed upon troling.

One cannot help smiling upon seeing these primitive methods, yet a great deal of work is accomplished, the horse-whim in question hoisting over 70 tons of ore in a day of 12 hours duration from a depth, on an average, greater than 200 feet.

Primitiveness.

It is most singular but perhaps quite true that shovels and picks are scarce articles in mines about Guanajuato, the natives using canoe-shaped horn spoons for shovels and a gad or a bar for a pick. In filling the basket or bag the horn is used to drag the material into either receptacle; and to see an arriero (mule-driver) filling leather packing sacks enlignens one as to dexterity with even so simple an implement as this. Everything being conducted in such a peculiar manner upon the surface, it is natural to suppose that surprises will be in store underground.

"Boca Mina" and "Tenateros."

All those employed underground descend to their respective working places through the "Boca Mina," as it is called—an inclined way provided with series of steps reaching from the surface to the various stations and bottom of the mine. The steps of the series are not all of uniform inclination.

The ore carriers or tenateros (so called on account of carrying tenates or ore bags in which the whole product of the mine is handled), rush down these steps in a manner that seems quite

reckless to those unaccustomed to such a sight. The tenateros are paid by the number of "arrobos" (an arroba being 25 pounds) they move from the working places to the different stations, where clerks check names, number of loads and their approximate weights.

The "tenate" is carried on their backs and kept from falling by means of a hand attached to the underside, passing up the sides of tenate and around the head of the bearer.

It is a weird sight seeing these men of harden almost bent double under a load of from four to six arrobas passing in single file before the clerks, who are waiting at the dimly lit station to tally these wretches passing through their hands like so many animals, tallied and searched before the day is done and all for a pittance of a possible 50 cents in Mexican silver which they receive daily.

Devotions.

In many of the mines there is a little chapel or shrine at which the different operatives make their devotions, should they care to, both in descending the mine and ascending to the surface. There is an amount of reverence among miners of every nationality, and Mexicans show it in a great degree.

In ascending a perpendicular shaft they are suspended to the cable by means of a sling in which they sit, and while being hoisted they are chanting in order that they may reach the surface in safety. Being suspended to a cable in a sling, no guides, and three other cables in the shaft moving and stationary is quite sufficient to deter most men from making their exit through the shaft more than once.

Pumping.

Another surprise is the method of pumping one sees adopted in some of the Mexican mines. In those where a vast quantity of water is not made in a day, there are pipe lengths furnished with a long wooden rod to which is attached a suction valve at one end and a handle for the homero (pumpman) to manipulate at the other.

The water is removed by means of these primitive hand pumps to cisterns stationed at different depths through the workings, and from them to the "sump," where the balloon-shaped hide bucket is brought to play in its final removal to the surface. The pumpmen receive 50 cents a day, a stipend hardly sufficient to allow of many luxuries.

The Miner.

By means of hammer and drills, gad and bar, the Mexican miner is capable of breaking a quantity of ground but naturally he is handicapped in not being the possessor of a pick. Why it is that this article is so rare is a mystery that could only be explained by the Spaniards. Why they did not introduce it into Mexico is something to marvel at.

The miner is the best paid among Mexican mining employees, for drilling is paid for at so much a foot or fraction of a metre and it is quite possible for him to earn from 75 cents to \$1.50 per day, according to the number of "cuartas" he has accomplished. They are naturally envied by the less fortunate "homeros" and men on the "planilla."

Removal by Pack-Train.

Every morning the mines are visited by a host of arrieros (mule-drivers) with the mule-train. The ore sacks, made from leather or fiber, are in readiness for the mule-drivers at the mouth of the shaft. The work is given and in a remarkably small space of time the contents of the piles have been dragged into the sacks by the horn spoons; the sacks are closed, weighed, tallied and packed on the backs of mules (as fine animals probably as may be found in the Republic), and started for the reduction works.

Sale of Ore.

It has been the custom for years on the part of mine-owners to dispose of the daily output of ore to the "Hacienda de Beneficio" (reduction works), where it is treated by the Patio system of amalgamation.

The ore is purchased by the "Monton," or 32 quintals a trifle over a ton and a half and is removed from the mouth of the shaft by the purchaser. Competition being run between the reduction works at present, better prices prevail than formerly. The Maquila (charges against the ore) varying according to richness and the distance of the mine from reduction works.

Searching.

It was mentioned earlier that the employees were searched upon leaving the mine. Were this formality not gone through, it is reasonable to suppose that very little of the very rich ore would find its way into the hands of the mine-owners, but instead, the small ore purchasers would reap the benefit of hundreds of thousands of dollars annually. In many cases this very rich ore for export would represent the profits the mine was working. This searching, the peon has been accustomed to for such a length of time, that it is accepted as inevitable.

All are drawn up in line; two boxes about 12 feet apart are placed upon the ground in a line with the doors. Behind the second box are all the men, except he who is standing on the first box in the act of being searched. The searcher passes his hands down the back and chest (the man's clothing as a rule being nothing but shirt and trousers), follows both legs, looks into the shawl or "serape," and examines the hat which is held in the hand. The man is finally compelled to say "Al lado de Dios" meaning I am with God, in order to see whether there is any mineral hidden in his mouth. A

few moments suffices to go through this form with each man, he steps down and passes through the door, his own master until the following day.

It has not been the intention to criticize Mexican methods but simply to jot down that which may prove of interest as being novel and different to anything seen by the majority of miners in the United States.

Finding of the Lost Ship Mine.

Many are the legends which have been spun by the camp-fire and in the public press about the "Lost Ship mine," as well as about the final taking off of John Shippe at Visalia, some 23 years ago, while resisting arrest for disturbing the peace. Many an expedition has been organized to search for the mine. It was always assumed that Shippe's trail, after following up King's river past the U. S. Grant tree, turned and crossed the river at some unknown point. It never seemed to occur to the mine-hunters that Shippe probably followed the Inyo trail through the Kearsarge pass and east of the Sierras.

While calling on our patrons near Kernville, a few days since, we met David and Luther Burton, who informed us that they were just in from a five weeks' cruise on the desert to test the John Shippe mine. We elicited this statement: The mine was shown to Shippe by his squaw, who always accompanied him when he visited it. After Shippe's death, she returned to this vicinity and entered into an informal marriage with a certain prominent stockman of the South Fork valley, and one child was the result of the union. She showed her husband the mine, but as he had no taste for mining, he kept the location a secret for 17 years. Finding himself too much engrossed with the care of stock to handle the mine, he proposed to share it with the above named young man, but finally concluded to turn it all over to them. They then proceeded to locate the spring designated by the squaw as the place where Shippe ground his rock, and having found it, commenced to excavate to find an arrastra used by Shippe. At a depth of a foot and a half, they struck tallings discharged from the old mill.

We were given a piece of rock, and it is well honeycombed and well impregnated with oxide of iron. Among the oxides, bright specks of yellow gold are profusely scattered. The vein is partially gold-bearing, although it contains some silver. The ledge is about eight feet wide, and in some parts the gold occupies nearly the whole width, while in other places it only occupies a foot and a half.—*Farm View.*

CENTRAL GRAVEL MINE.—The tunnel of the Central gravel mine, on the Washington ridge, is nearly completed. It is now in over 650 feet, and Superintendent Chadsey thinks he has only 90 feet farther to run to strike the channel. Water is coming in freely at the top of the tunnel, and there is every indication of the close proximity of gravel. The tunnel is to tap the old shaft that was sunk 30 odd years ago. This shaft was put down to the gravel, where work was suspended on account of the water. Mr. Chadsey will run his tunnel to strike the gravel channel about 30 feet north of this shaft, thus draining the shaft through the gravel. This will be much safer than tapping the shaft direct. When the Central Co. of Sacramento took hold of this mine, they simply took a 35-year-old shaft, filled with water, and a lot of rather hazy information concerning the same. But the gravel was known to pay, and so they began operations and have stuck to it for several years. It is now thought their tunnel will not be low enough to drain the bottom of the shaft. But they will not let that bother them. If they come within 30 or 50 feet of the bottom, a pumping plant will be put in, and drifting commenced immediately. If the gravel is rich enough to warrant it, a new tunnel will then be driven lower down. They are bound to succeed, for they have "stayed with it" so long they will never give up now.—*Nevada Herald.*

A COMING MINING SECTION.—It has been known for 25 years that there were leads of gold, silver and copper on the reservation in the immediate neighborhood of Pocatello, Nevada, but prospectors have steered clear of the hills, as they had Uncle Sam and a jealous tribe of Indians to contend with. Now, however, prospecting is going on in many parts of the reservation, many claims have been located, a survey of the reservation has been ordered, and it will doubtless soon be thrown open to the whites.—*Silver State.*

THE RENO GAZETTE quotes John W. Mackay as saying that there is low-grade ore enough in the Con. Virginia to keep 200 stamp-running for 20 years. What an immense thing this will be for the Comstock if the ingenuity and scientific appliances of the Janins prove true of extracting the 25 per cent of the ores hitherto lost? There is much hope expressed in mining circles that they will accomplish all they claim they will do.

VERDICT AGAINST A MINING COMPANY.—The case of P. J. Keys against the Keys Mining Co. pending in the United States Circuit Court at Carson, Nev., during the last few days for the recovery of back salary as superintendent, amounting to over \$2600, went to the jury, who returned with a verdict of \$1015 for the plaintiff. Notice of a new trial was given.

The Mining Congress.

An Abstract of the Proceedings.

Associated Press dispatches dated Nov. 19th from Denver are as follows:

The session of the Mining Congress was delayed in meeting this morning through the tardiness of delegates in consequence of attending the drilling contest last evening.

Butte, Mont., broke all records in the way of double-handed drilling, and defeated the champions of Colorado.

The Committee on Credentials reported 559 delegates present from 31 States and Territories.

Niles Searles, ex-Chief Justice of California, was recommended for permanent chairman, and it was decided to discuss a number of subjects, among which was that of the coinage of silver. The report was adopted.

Judge Searles, in the course of his address accepting the chairmanship, emphatically indorsed the unlimited coinage of silver.

In the afternoon the Congress appointed one vice-president from each State. Chief Skiff of the Mining Bureau of the World's Fair was given 30 minutes to set forth the advantages of the Columbian Exposition and the necessity of the mining States making an exhibit that would give the world an idea of the importance of the industry.

Senator Wolcott, in a brief speech, set at rest all doubts as to his position on the silver question. He hoped that the congress would shape into proper form such matters as require legislation, and in closing his remarks said: "No matter what may be the wishes of the majority of the party to which I belong, or its oblique executive, and no matter how much my course may remove me from the sunlight of official patronage, until some new light crosses my vision, which is not yet dimmed, I will, as long as I remain in public life, vote for the free and unlimited coinage of silver." The audience arose and applauded Senator Wolcott until President Searles rapped for order.

E. R. Holden, as leader of the faction demanding the coinage of the American product only, predicted disaster and ruin to the banking and commercial systems of the country if foreign nations were allowed to unload their silver upon the United States and receive gold in return. He asserted that Mexico in another year would produce more silver than this country, and that one small district in Australia was preparing to produce more silver than Colorado.

Charles S. Thomas of Colorado replied to these arguments and hotly advocated the free and unlimited coinage of silver. The congress then adjourned until next day.

On the Committee on Resolutions the Chairman appointed as members at large Colonel C. C. Goodwin of Utah, ex-Senator H. W. Tabor of Colorado, ex-Governor Hauser of Montana, Robert Mackay of Canada, and J. J. Mullaly of Missouri.

Further dispatches, dated the 20th, say: The Committee on Resolutions appointed by the Mining Congress has agreed upon their report. It declares that certificates of the Government, backed dollar for dollar by gold or silver coin, on deposit in the Treasury of the United States, is a safe and sound currency, and has been approved by the people; that the First National Mining Congress is unalterably in favor of the principle of bimetallicism; that gold and silver should have by law equal rights, uses and monetary purposes, and to that end is demanded of the Congress of the United States the enactment of laws by which silver shall be coined free in all mints equally with gold, and to have with it full and unrestricted monetary power, and that they in the ratio of 16 to 1, and when the coinage is represented by Treasury notes, each dollar shall represent 412½ grains of standard silver or 25.3 grains of gold. One resolution reads:

WHEREAS, The Supreme Court of the United States has declared "that the exception of mineral lands from grants in Acts of Congress should be considered to apply only to such lands as were at the time of the grant known to be so valuable for their minerals as to justify expenditures for their extraction; and

Whereas, This dictum of the Supreme Court, if it should become a law, would invest the Pacific railway companies holding grants of land from the Government with a vast number of the best mines discovered within the limits of said grants by prospectors and miners, who have located thereon in good faith and developed and sold therein in the honest belief that said grants were limited to agricultural lands only, as declared in the Acts of Congress making them.

Resolved, That this Congress protests against any construction of the statutes of the United States which will result in such a system of wholesale confiscation and consequent enrichment of great combinations already enjoying the bounty of the Government and calls upon the Representatives of the people in Congress assembled to take such prompt and immediate action as may be in their constitutional prerogative to destroy the threatened danger.

Resolved, That the Alien Act, so far as it operates to exclude foreign capital from investment in the mining lands in the Territories, is false in principle and pernicious in effect, and this Congress demands its immediate repeal.

R. C. Powers of Arizona, an avowed advocate of free coinage, occupied an hour in discussing the use of silver from the earliest days of the world's history to the present time.

E. R. Brown of Aspen said that America should declare the parity of the metals.

At this juncture Senator Stewart arose and announced that he did not own a share of

Comstock stood, thus refuting an old allegation.

Judge Harley Morse of Colorado spoke for 20 minutes in favor of free coinage.

Martin Maginnis of Montana denounced Campbell in a scathing manner for his cowardice in not advocating the platform upon which he was nominated.

Congressman G. A. Cassidy of Nevada declared that every man, woman and child in Nevada was united in favor of free and unlimited coinage. Cassidy advocated the forcing of the political parties to make that question a dominant issue in the next campaign.

In the afternoon T. C. Howell of California made a speech, placing his State on record as in favor of free and unlimited coinage of silver.

General Doniphan of Missouri and Daniel Sheedy of Colorado also spoke eloquently in favor of free coinage.

Judge Goodwin of Utah made an address, in the course of which he said he did not believe that the lower House of Congress would pass a free coinage bill this winter unless with the hope of the President vetoing it. He thought that they would come to their senses, however, in time. He then moved that the resolution for the free coinage of silver be passed by acclamation.

Albert Little of Maine made a brief speech, saying that he had become convinced from what he had heard in this congress that the free and unlimited coinage of silver was right.

The Connecticut delegates objected to the passage of the resolution by acclamation, and the roll of States was called, with the following result: For the free and unlimited coinage of silver, 481; against, 8. When Connecticut was reached great enthusiasm was manifested by the delegation from that State announcing their vote in favor of the resolution, and when the vote of Canada and Russia was announced in favor of the resolution there was another scene of confusion. When the total vote was declared the delegates went wild, and it was some time before order was restored.

The other resolutions given above were also passed. A resolution was unanimously adopted congratulating the management of the World's Columbian Exposition for the work already done and urging every State and Territory represented in the convention to prepare for and make exhibits commensurate with the importance of the exposition and of the developed and undeveloped mining resources of the State. It was decided that the next convention should be held in Helena, and the congress adjourned.

A Prospector's Fate.

A dispatch from San Diego, dated the 19th inst., says: Two prospectors named Brown and Crawford are in Ensenada, after a long trip through the Cocopah country on the peninsula. By steamer, this morning came the particulars of the finding of another desert victim by them several weeks ago.

They saw that while prospecting southward from the Old Sulphur mine, about midway between the Cocopah range and the Colorado river, one day they suddenly came upon the body of a man, who had evidently died from thirst. The corpse was evidently that of a German. He had been dead many days, but the body was not decomposed, the dry air of the desert having preserved it to a remarkable degree.

There were evidences of the man having endured terrible agony. His finger nails had been torn off in his efforts to reach water by digging in the sand. The body was buried by the two prospectors, who then continued on their journey.

Two miles farther on they found the bodies of two horses, and the packs which the animals had carried in life were still attached to the bones. The outfit probably belonged to the German. The packs yet contained the bacon, flour and hardtack found in every prospector's outfit. There was nothing by which to identify the remains of the unfortunate.

Columbia River Scenery.

We turn again to the great Northern treasury of sublime scenery, the Columbia river, and give on this page a striking picture of the Oneonta gorge, one of the most interesting rock rifts of its most interesting region. The Oneonta name is given to a gorge, to a waterfall, and to a healing bluff, which overhangs the railway. All of them win the admiration of the resident and tourist.

WATER RIGHTS.—There is a great lawsuit pending in Lassen county, involving about 18 plaintiffs and 120 defendants, over water rights on the Susan river. The plaintiffs, most of whom are old and wealthy settlers, located on the lower end of the river many years ago, and have been using the water for irrigation all these years. In the march of civilization hundreds of people have settled along the upper part of the river, and very naturally diverted some of the water. Thus the amount flowing to the lands of plaintiffs grew less year by year. There is money on both sides, and no doubt the case will not end until settled by the Supreme Court.

FENCING IN THE RAILROAD.—The Northern Pacific is fencing its road at the rate of 3000 miles a year. In the year ending June 30, 1891, there were killed on its lines 4258 head of cattle, against 4802 in the previous year.

Dredging Bars.

An Extensive Mining Undertaking Outlined.

The San Joaquin river is said to be as low now as it has been for three or four years, says the Fresno *Expositor*, and the low stage of the water naturally calls to mind again the beds of gold-bearing sands and gravel that miners have always believed were in the bottom of the river all the way from Millerton to Hamptonville, and farther down for an indefinite distance.

It is known to an absolute certainty that the bed of the river in that vicinity contains much gold, but just how much cannot be known. There are those who believe that there is enough of the precious metal lying beneath the water and mixed with the sand and gravel that the floods have brought down, to make many men independently rich, if it all could be taken out. This has been a prevailing opinion among miners since the days when the sand bars and

the channel and pan it out. Scoops and spades and baskets and other similar arrangements have been employed, with results that go to show conclusively that there is much gold in the bottom of the river; but the means of getting it out are so rude, and the expense so great, that the undertaking never was very profitable.

When the river is low, as it is at present, considerable success has attended these efforts, but it all has been on a small scale, without much system, and each man working for himself and against everybody else.

A Large Plan.

Last summer a series of estimates were made, but were kept very quiet at the time. The purpose was to test the practicability of putting in an extensive dredging apparatus in the river along the Hamptonville toward Millerton. This was not the scheme of tunneling the mountain, thus leaving the channel dry, and laying bare all the beds of sands which thou-

also be lifted by the pump, along with sand, and all would come up together.

Sluice-Box.

The large barge, bearing the pump, the engine and the dredging machinery, would be firmly and securely anchored in its place. Below it, that is, down the river, would be smaller boats, also securely anchored, and these small boats would serve as piers on which to rest a long line of sluice-hoxes, through which the sand and gravel could be carried off, and dumped a considerable distance down the river, out of the way.

These sluice-hoxes were to be the kind ordinarily used in placer diggings, with the arrangements in them for collecting and holding the gold that should be separated from the gravel.

The larger howlers, too heavy to be carried off through the sluice hoxes, could be dumped in a boat kept for that purpose, and taken down the stream a short distance till they were out of the way, and there could be unloaded without much trouble or expense.

By this means the pump would lift all the sand and gravel within reach of it; this gravel could be sent through the sluices, the gold could be separated from it and retained, while the waste would be carried out of the way.

Moving the Barge.

When no more debris was in reach, the barge could be moved farther up the river and new beds brought within reach of the pumps. The time, trouble and expense of moving the machinery need be very small, in fact, this item of cost is said to be so small that it need not be taken into consideration at all. The whole time for a move would be only a few minutes.

Up the Stream.

Thus the dredging pump would work its way slowly up the stream, pumping up the gravel and sand, and leaving the bedrock bare as it went, and removing all the refuse down the stream, entirely out of the way.

There would be nothing left undone. The paying gravel would all be pumped up and removed. As the machinery would move up the river, nothing for the miners of the future years would remain. The rocks too large to be lifted by the pump (and there would be many of them) would not need to be removed, as they could be left lying in the bottom of the river. The pump is so constructed that it will dig down among the large rocks and bring out all the sand and small gravel.

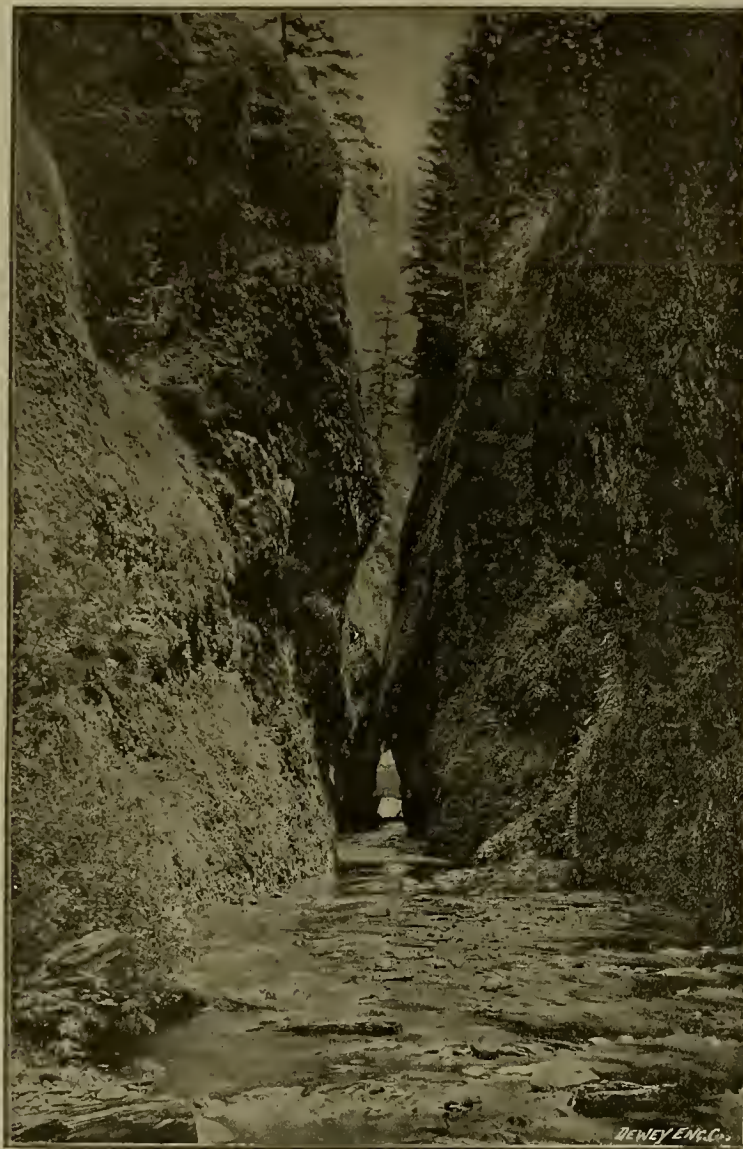
The Estimate.

The gentleman who was here making estimates in the matter stated that in his opinion there would be as much as one pump, even of the largest size, could handle in several years. The gravel is very deep in many parts of the channel, and it would take some time to reach the bedrock.

The quantities of gold that would be obtained cannot be so accurately estimated; but there is no person who is acquainted with that locality, and with the history of the mining that has been done there in the past, but that is satisfied that the pay will be very large, and will fully remunerate for the outlay, notwithstanding the expenses of putting in the machinery and running it may be considerable.

At any rate, it is considered that the scheme of pumping up the gravel and running it off through sluice boxes is much more practicable than the one of tunneling the mountain and thereby turning the river from its channel. At any rate the pumping plan is less expensive, and if it will pay at all, it will pay more or less from the start.

In the tunnel proposition this is not the case. The expense will be very large before any return at all is made. It cannot be stated whether there is anything going to be done in the matter, but elaborate plans and estimates were made looking to this end some time ago.



ONEONTA GORGE ON THE COLUMBIA RIVER.

gravel beds on the margin of that stream first began to give up their golden spoils.

Early Diggings.

The early diggings in that vicinity yielded fairly well. There were many rich patches found along the river beneath the gravel. The farther toward the middle of the river the miners could go, the richer the soil.

But the water was in the way of approaching the mid-stream, and the deepest part of the channel, where it was natural to expect the most gold. When the river was low, it was impossible to work a little way toward the channel, but never very far; but, as has been said, the farther the miner could push his placer diggings toward the middle of the stream, the richer were the findings.

For many years the miners worked all along the river, both above and below Millerton, and even yet there is some mining done at times; but the best paying patches were long ago exhausted, and the miner had to content himself with a small find here and there.

But the fact that the large and deep beds of gravel in the main streams were untouched was never lost sight of, and all the time the old miners, who had seen the prosperous days back in the fifties, cast longing eyes toward the stream that flowed over such beds of golden sands, just beyond their reach—"so near and yet so far."

Diving for Gold.

More than once efforts have been made to fish up the sand and gravel from the bottom of

sands of years of floods had brought down. The tunnel project was another and independent scheme.

The *Expositor* was in possession of the facts regarding the plan for dredging the river, but for special reasons did not make the facts public at that time.

Now, the plan can be published; but at the same time it cannot state whether anything will be done with the plan or not. A mere statement of what the plan was is all that will be given at this time; and there are none who would deny that it is practicable, and would develop the gold-beds beneath the waters of the San Joaquin nearly as effectively as the tunnel through the mountain and the changing the channel of the river would do, and very much cheaper.

Dredge Pump.

The plan as proposed was to build a large barge, on which could be placed an engine and a dredge pump, such as are used in dredging harbors and deepening the channel of rivers.

A pump of this class, capable of lifting gravel and boulders from the size of the smallest sand up to a size of four or five inches in diameter, was what it was proposed to use. Such a pump would lift ten tons an hour.

The plan was to begin at the lower end of the bar, and pump up the gravel and sand clean, leaving nothing but the naked bedrock on the bottom of the river. Of course the gold mixed with the sand and gravel would

GOLD EXTRACTING WORKS.—The Kron Rolls, which have been set up at the Gold Extracting Works, were put in motion to try the machinery and see that it was in perfect working condition. The trial was entirely satisfactory, and the rolls will now be put to work in reducing ore into fines. The ore will first be put through a rock-breaker and then fed into the rolls, being crushed dry. When reduced to the proper fineness, the ore passes through a screen (with 40 meshes to the inch) and then deposited in a bin, the whole being inclosed to prevent the fine particles filling the atmosphere. As the rolls are graduated, if the ore is not reduced to the proper fineness at the first crushing in passing through the screen, an elevator raises it up for additional crushing. The steel tires on the rolls are hardened by a process only known to the manufacturer, and their wear by attrition with the rock is slow. When necessary, these tires can be replaced by new ones, as in the case of shoes and dies in stamping batteries. It is claimed for the Kron rolls, of the size of those at the extracting works, that their crushing power in 24 hours is equal to a 30-stamp mill, should the work to be done require it. This machinery is driven by a Pelton wheel, with 20 inches of water under 500 foot-pressure.—*Grass Valley Union*.

A VALUABLE MINE SOLD.—The valuable property of the Lilloet Hydraulic Mining Co., situated near Lilloet, B. C., on the Fraser river, has been sold to New York capitalists for about \$300,000. The papers are to be at once forwarded to New York through the bank of Montreal.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Dispatch*, Nov. 21: The mines are getting along about as usual. At the Wildman the mill has been shut down for a few weeks, so as to give the men in the shaft a better chance to work. They have only one compartment to hoist in and in sinking, the bucket is required to handle timbers, waste, etc. The Hector mill started up 30 stamps on Monday. The other 10 stamps will be ready by the first of next week. Retimbering the shaft is progressing slowly, as only a day shift is working. The new hoisting works give very good satisfaction. The Lincoln Co. are getting ready for winter. They have just completed the cleaning of the ditch and had some repairs on the mills. The Belmont mill is idle at present. The South Eureka is still sinking with favorable prospects. At the foundries business is quite slack at present. Knight & Co. are doing some electrical work.

SOUTH SPRING HILLS.—*Ledger*, Nov. 21: For some months this mill has not been turning out bullion after its accustomed liberality. It has been passing through a period of depression to which all the prominent mines on the mother lode have been more or less subject. It is an erroneous impression that seems to prevail upon the minds of many outsiders that the gold is evenly distributed through a gold-bearing quartz vein; and that when a mine once begins to pay dividends, the dividend-paying era should continue just so long as the mill is supplied with ore to crush. This is not so. The ore-body has its mutations in gold-bearing qualities, as well as in dimensions. It widens out and narrows up, gives up its treasures liberally or niggardly, as the case may be. The South Spring Hill is just emerging from a comparatively barren portion of the vein. The product lately has only just about kept pace with the expenses. Now, however, there are strong indications that another prosperous era is about to dawn. At the 900-foot level the vein begins to show its old time character, and the stockholders are correspondingly elated. Some 30 men were laid off at the Clinton Consolidated this week on account of the failure of the water supply. It is believed that it is only temporary. It is reported that the Amador Queen mine in Hunt's gulch is about to be started. The property was lately deeded by the Amador Queen Co. to W. B. Bardue, and work is to be inaugurated under his management. Timbers and other supplies are being hauled to the mine.

El Dorado.

BLUE GOUGE.—*Mt. Democrat*, Nov. 21: Wm. Craddock has been up to the Blue Gouge mine for several days, returning Tuesday. Mr. Craddock is very favorably impressed with that property. It is a large vein of low-grade material, worth from \$3 to \$6 per ton, and enough of it practically in sight to supply 100 stamps for more years than most of us shall live. They can run a tunnel in from the creek to tap the vein over 500 feet below the surface, from which level, ore can be taken for a lifetime without hoisting, and with their own water-power. Mining and milling can be so cheaply done that ore which will yield even \$1 per ton can be worked at a good profit.

Inyo.

DARWIN MINES.—*Inyo Index*, Nov. 18: These mines, always good, but of late years rather quiet—are awakening and coming to the front. Jack Wilson was in town last week and gives encouraging reports from that, the New Coso district. The Independence mine, the excellent prospects of which have before been mentioned in these columns, is proving all its owners have predicted, and now shows the largest body of ore ever seen in Darwin. They have a large lot on the dump, much of it sacked, but find difficulty in shipping as rapidly as they wish on account of the scarcity of teams. The Sorba mine, a recently developed prospect, is looking way up, and that being worked by Lewis & Co. is also looking very well. In the Defiance all is encouraging. Frank Fitzgerald and J. J. Gunn are both getting out lots of rich ore and making regular shipments from Modoc. More men are needed in and about Darwin to get out the ore, and more teams to haul it away.

Mono.

THE BODIE CON.—*Bodie Miner*, Nov. 21: During the past week east crosscut No. 1, 700-foot level, was extended 12 feet. East crosscut No. 2 from main north drift, 700-foot level, was extended 6 feet. Upraise, 620-foot level, was extended 21 feet. South drift, 6n feet above the 5nn-foot level, was extended 7 feet. North drift from top of upraise from west crosscut, 200-foot level, was extended 8 feet. East crosscut from top of upraise from main north drift, 200-foot level, was extended 10 feet. There were employed 8 miners and 1 carman, and jointly with Mono, 1 engineer, 1 blacksmith, 1 carman, 1 watchman, 1 foreman, 1 assayer and carpenter, 1 boiler-maker.

THE MONO.—During the past week south drift No. 2, 700-foot level, was extended 15 feet. East crosscut from south drift, 700-foot level, was extended 5 feet.

Nevada.

THE NORTH BANNER.—*Grass Valley Union*, Nov. 21: Important improvements are contemplated at the North Banner mine, the plans for which are now being drawn at San Francisco. The main incline, which has heretofore been used for the purpose of raising the ore and water to the adit level is to be raised to the surface, a distance of 300 feet, and a new steam and water plant erected, either power being used as required. From the new works a tramway will be constructed for conveying the ores to the mill, which will be about 800 feet in length. Larger pumps will be put in to control the water, which has been found to increase in volume since the new 500 station below the adit tunnel level has been opened, and where a strong vein, carrying high-grade ore, is shown. The adit level will be continued in use for the purpose of drainage. By extending the incline to the surface, the mine can be operated to better advantage, and by the use of larger pumps, interruptions cannot again occur, as has been the case for several months past. The work of opening the incline will require about three

months, as the ground is favorable and sinking and raising will be carried on at the same time. In the meanwhile the new surface plants will be put up. When the new works start up, sinking for the 600-level will be started. The appearance of the mine for making future large returns is in all respects very encouraging.

MERRIMAC MINE.—*Grass Valley Union*, Nov. 19: Supt. Chas. Stocks is pushing the work of reopening the Merrimac mine, having a force of 11 men at work in preparing the ground for the erection of hoisting and pumping works and repairing the old shaft. Both a water and steam plant will be put up, the steam to be used when an interruption of the water may occur, of which there is a probability at times in the winter season when snow storms may obstruct the flow of water in the South Yuba canal. The company starts up under good auspices, as 40,000 shares of the capital stock have been sold for a working fund, sufficient to erect the necessary buildings, repair shaft and drifts, and doing a large amount of dead work.

WASHINGTON TOWNSHIP.—*Cor. Nevada Transcript*, Nov. 23: Our mines that are working move along quietly, and their managers don't have much to say. Yet we have one of the best quartz mining districts in the State. There are a number of good gold-bearing ledges in this vicinity. All we need is capital to work them. In Lindsey Hill is the Lindsey mine which has proved itself to be good. The Blue Jay is a first-class prospect; so is the Day claim. The Governor Morton is one of the richest prospects ever found on the Yuba river. There are two other promising claims in the same locality, making in Lindsey Hill six good known prospects, all of which could be reached by a tunnel from the foot of the Hill. Next we come to the German mine, then to Fritz Meister's, both on Canyon creek. Donahue & Stewart also have a splendid outlook on Canyon creek, and so have the White Bros. The Valentine, owned by M. M. Cole, has a shaft down 100 feet and 500 or 600 feet of tunnels. This mine prospects well from top to bottom, and is good for \$20 a ton. The Giant ledge, a mile from Washington, is 20 feet thick and prospects \$9.60 a ton. There are around Washington more such locations owned by men too poor to develop them. There is a chance here for all the mining capital in San Francisco to be profitably employed.

Plumas.

GREEN MOUNTAIN MINE.—*Greenville Bulletin*, Nov. 18: The work on this property is progressing favorably. We are of the opinion that next season this mine will be seen operating on a large scale. Mr. Cornell has worked hard to put it in good shape, and he has accomplished a great deal. With the large tunnel pushed ahead and cross-cut work done, an immense mining property will be developed, for the cluster of mines lying ahead in the mountain will all become tributary to this tunnel. This mountain may be said to be a network of gold-bearing quartz veins, which, with an intelligent use of capital, will be made to yield up its rich deposits of treasure. In its proportions and possibilities this mining enterprise is gigantic. No extraordinary expense in either mining or milling the ore will be necessary. The hacks would be more than 1000 feet, and all of the ore, by means of the tunnel, would be dumped into the 60-stamp mill at the foot of the mountain, which is run by water power furnished by the Round Valley reservoir. The ditch leading from this body of water to the Green Mountain mine, is in better condition than it has been for a number of years, the result of Mr. Cornell's work last summer. In a few days, A. R. Bidwell, now of Oakland, will arrive here and take charge of the mine, in the absence of Mr. Cornell, and it is the intention of the owners to push development and other work as fast as possible.

San Diego.

AT JULIAN.—*Sentinel*, Nov. 18: Robert Gardner will resume work at his old stand on the Blue Hill. The owners of the Chaparral have again commenced work in this property and have milled a small crushing. The Helvetia is running a full force and ten stamps. The need of the hour at this property is more water. Messrs. Shide and Slocum have taken a lease on the Poorman mine. From the foot of a 60-foot shaft they intend running a level to cut the Joker ledge. Work on the Ruby, Ready Relief, Hidden Treasure, Cincinnati Belle, and Gold King is steadily progressing and every day adds to the value of these mines. Assessment work on the Richmond has developed that mine into a valuable property. A two-foot ledge of medium-grade ore is in sight, together with a narrower stringer of very rich rock.

Shasta.

THE SKY BLUE CAMP.—*Redding Free Press*, Nov. 21: E. P. Connor informs us that matters are lively on the east side of the river above Middle Creek station. The Crossbow mine is showing up good. Ore that assays up in the thousands is being taken out of the drift. The ledge is six feet wide. The ore is being shipped to S. F. for treatment. This mine was bonded some time ago to the Unity M. Co. A day and night shift are employed. Mr. Connor has five men taking out ore from the Castle Peak and the Manatee. The Manatee mine is the first extension of the Sky Blue on the south. The Manatee shows a three-foot ledge of excellent ore. The shaft is down about 40 feet and will connect with a tunnel 90 feet long. Marich, the Redding barber, has two men sinking on his ledge. They are down about 20 feet and have a three-foot ledge. It is a good prospect.

NOTES.—John Bauder has sold his interest in the Banghart mine, located at the head of Mad Mule in the Whiskeytown mining district, to his partner, John Fleming. The Texas Consolidated mine at Old Diggins has been bonded until Jan. 1, 1892, to a Chicago company. This is one of the best mines in Shasta county and the bond is for a big price. Mr. Parker and Mr. Bryan, interested in the Crown Point Consolidated mines lying between Middle Creek and Shasta, are here from Sacramento to look at the property preparatory to commencing operations. This company is a strong one, composed of S. F. capitalists. Col. Lyons, who was in Redding on Thursday, informs us that he has a five-foot vein in his tunnel at the old Martin mine in the Old Diggins district. The tunnel taps the vein 100 feet from the surface. Gold predominates, yet the sulphurets assay all the way from \$20 to \$200 per ton in silver.

HIDDEN TREASURE.—*Shasta Courier*, Nov. 21: A correspondent from the Hidden Treasure mine,

on the Iron mountain road, says: If you happen up this way, would be pleased to have you stop and look at our mine. We are not making much noise, but we can show one of the best prospects in Northern California. We have about \$1600 worth of improvements in the shape of cuts, shafts, tunnels, buildings, and also a small mill on the creek, known as the Day vacuum stamp mill, which runs by water power, capacity about 3000 pounds per day. Will have a Blake rock-breaker this week for crushing shipping-ore and for the mill. The ledge is about two feet wide and averages about \$7 per ton in free gold. The returns from the Selby Smelting & Lead Works, S. F., gave for one lot of sulphurets ore, silver, 10.84 ozs.; gold, \$38.76 per ton; onelot gave of sulphurets ore, silver, 76.65 per ton; gold, \$221.10. We have been going along slowly, but at present are pushing the mine for a paying proposition, with all the hands we can work to advantage inside and out of the mine. Will ship the high-grade ore, and run on the free gold ore.

IGO.—*Cor. Shasta Courier*, Nov. 21: The cross-cut at the Crystal has been discontinued, and sinking on the pay chute of ore will probably be resumed. The south drift shows a length of 60 feet of ore; it extends also to the surface 100 feet, showing a four-foot ledge, with six to 12 inches of at least 200-ounce ore. Wright & Sons' mine improves with depth. Two shipments have been made since my last. The second shipment went over \$200 per ton. The ore now assays up to 800 ounces. W. D. Bull's second shipment did not go quite as high as the first, but the ore has widened from a finger's thickness to five inches, and has all appearances of permanence. Robinson & Son have found a vein of good shipping ore in their yard, and are taking some fine ore therefrom. The Euhanks boys are getting excellent ore from their ledge. Woodfill also has good ore in his shaft. A rich find has been made in Kanaka on Sec. 10. How extensive it is has not been determined, the parties interested being at work on the other mines. O. Engle is doing some development work on his gold ledge in Kanaka. Shirland & Bro. are running their arrastra on Creighton ore; they are also opening a silver prospect close by. E. L. Ballou is running his arrastra on Manzanita ore. Litten & Moody are doing fairly well with their arrastra. The tunnels so far run show a larger body of ore than was expected. The numerous finds made the past few months have started even the chronic growlers to prospecting in the hills; and as the country hereabouts is full of small veins of varying richness, it is quite possible they all may "strike it rich."

Sierra.

FOREST CITY.—*Cor. Mt. Messenger*, Nov. 21: Times are improving somewhat hereabouts, due to the favorable developments in the Bald Mountain extension, and encouraging prospects in other mines. The cleanup for last week's work at the B. M. Ex. drift mine was 88 ounces. As soon as water is sufficiently abundant the number of drifters will be largely increased. Everything is favorable for a rich and permanent mining property.

Siskiyou.

CHINESE COMPANY.—*Yreka Journal*, Nov. 18: The Chinese company at Benz Bar, Klamath river, is now sinking another cut, from which the miners will no doubt realize as good if not better pay than from the last cut, which paid handsomely.

GRAVEL.—Phil Mott & Co., below the above claim, are now taking out good pay in cleaning up hedrock, and will realize considerable more dust before the river mining season closes. The old Sleeper claim, just below Honolulu, Klamath river, is paying exceedingly well, and the outcome will be an unusually large yield of gold dust this season. The Beebe Bar claim, above Honolulu, has been shut down, owing to reaching high hedrock. In reopening again next season, work will be resumed in a new direction to reach the bed of the ancient channel in the Klamath Basin at that point. Martin Andrews & Co. are still working their river claim below Hamburg Bar, on the Klamath, but how they are doing at present we are unable to learn, except that during one week lately they cleaned up 100 ounces. Maplesden & Co., in same vicinity, are also working industriously in their river claim and doing well. Work is carried on day and night at the Hegler Bros. and Aldrich quartz mine on Hamburg creek, in getting out an abundance of quartz from a 5-foot ledge, which keeps the mill supplied constantly. Boyle & Co., Spencer & Co., and others on Hamburg creek, are also taking out considerable quartz, which pays well.

QUARTZ.—The Portuguese Company, in the Humphack quartz mine on Salmon river, closed a trade with a Los Angeles Co. last week, by which the Los Angeles men are to pay \$120,000 cash within 10 days time. A new mill has just been completed at this claim, and is ready to start up when sufficient water comes, which will be very soon now. Over 400 tons of rock are on the dump, that will yield at least \$70 per ton, and a large force is kept constantly employed getting out more quartz.

Tuolumne.

RAWHIDE.—*Union Democrat*, Nov. 21: The Rawhide mine is producing ore in quantity of exceeding richness in free gold, and steadily improving as the work of development, under the able charge of Mr. Nevill, proceeds. It seems destined soon to be the leading mine of this section of the State. It is one of the old abandoned mines of California.

THE EXPERIMENTAL GULCH MINE, near Columbia, is in profitable operation. The grade of the ore is low, but the great extent of the ore bodies, inexhaustible in fact, the favorable location of the mine—no pumps nor hoisting works being required—the fine water power, and the economy with which the ores can be mined and milled make it a safe and profitable investment. The chief factors in this mine are its permanent character and ability to yield large quantities of ore.

PLACERS.—*Independent*, Nov. 21: Very rich placers are now being developed on Kincaid's Flat, Luis Page, now mining on Bald Mountain, once owned, with three brothers, the Bonanza claim. There are some placer claims near Confidence that were never exhausted, although they produced over \$25,000.

IDLE.—The Keltz mill has been idle for some time on account of the scarcity of water. Work is still carried on in the mine.

POCKET.—Darsey & Conn are working upon the same ledge upon which the Bonanza is located. They found a small-sized pocket a few weeks ago, and are looking for another. A number of men are

placer mining on Frown's Flat, in ground that has been worked over five or six times. They are sluicing in the old-time fashion, and yet claim to be making wages. The old Pedro vein on Bald Mountain is still being worked. It has been mined for several years, and a large amount of gold has been found—as much as \$20,000 in one pocket, and many others of less magnitude. A pocket was found a short time ago.

SOULSBY.—It is announced that the Soulsby mine, one of the most prominent mines in the county, has been purchased by a company. Lewis Page, 35 years ago took out \$100,000 from a chute on Bald Mountain. Like too many of our successful miners, he was careless with his money, and after mining in other States for several years, he returned to good old Tuolumne. He formed a company, and is running a tunnel into Bald Mountain to drain a ledge which he has every reason to believe is rich. They are working eight-hour shifts, two men on each shift. The tunnel is now in 460 feet, and it is 240 feet farther to the shaft. The work will cost about \$10,000 before any gold is taken out, but the company seems prepared to spend it, and confident of a rich remuneration.

OPHIR.—A rich body of ore has recently been struck in the Ophir mine, at Easton's, above Cherokee Flat. The mine is owned by P. H. Way, P. Easton and Mrs. Easton. The company has expended a large sum of money in the erection of a stamp mill, hoisting works, pumps and other paraphernalia, besides incurring the expense attending the sinking of an incline several hundred feet through dead rock, every foot of which had to be blasted. The owners were fully warranted in making such an outlay, as between \$16,000 and \$17,000 had been taken out from the same vein by a mere prospect in a shaft above, where ten tons still lie that will produce, the owners claim, \$300 per ton. The vein, from a feather edge, has within a few feet widened to several inches, and a milling test showed that the ore held gold to the extent of \$472 per ton. It is conceded by mining men to be very rich ore, and the indications are that the chute will widen. The ore in place is very handsome. The sulphurets carry galena, antimony and tellurium. The pump is worked by a burdy-gurdy. The company has a five-stamp mill and a Woodbury concentrator.

NEVADA.

Black Knob District.

ANTIMONY.—*Reno Journal*, Nov. 18: Extensive operations are being carried on in Black Knob mining district, 15 miles from Lovelocks, in Humboldt county. There are two well-defined antimony leads in the district. These are owned by Eastern men and are under the management of Dr. H. H. Hutchens, who is a practical chemist and assayer. There are ten claims of 1500 feet each on the lead. Two or three of these claims are developed by shafts and tunnels to a considerable extent. There is a shaft 300 feet on one of the claims, and drifts have been run on the lead from the shaft, 100 feet on the first level, 200 feet on the second and 300 on the lowest. The ore vein ranges in thickness from six inches to four feet. The ore averages 33½ per cent metal, some of it running as high as 75 per cent, which is pure antimony, wholly free from gangue, and melts readily in the flames of a candle. It is estimated that there are 4000 tons of ore in sight in the mines, and 400 tons on the dump. Dr. Hutchens has built a double reverberatory furnace of his own design at the mines. There are only one or two smelting works in the United States for the reduction of antimony ores, and these are built on different principles from that at Black Knob. As soon as the arrangements now being made are completed, the furnace will be run steadily, coal being used as fuel, and carloads of star antimony will be shipped weekly from Lovelocks to the East, where it is in demand for making type, habbit metal and for numerous other purposes.

Cherry Creek District.

THE STAR.—*White Pine News*, Nov. 14: News of a cheering nature reaches us from Cherry Creek. It is to the effect that the Hayward party of San Francisco has purchased the Nelson Con. M. & M. interests there, and that they will commence work immediately to pump the water out of the Star mine. This good news reaches us so direct, there is hardly a doubt of its authenticity. We hope in a few weeks to be able to congratulate the people of Cherry on having a live San Francisco company operating on Star Hill.

Pahranagat Lake District.

LOW-GRADE ORE.—*Cor. Piche Record*, Nov. 19: Mr. C. Rogers, a prominent citizen of Hailey, Idaho, who was reported in the *Record* two weeks ago as having gone to Pahranagat mining district, has just returned therefrom, and started back toward Hailey. The whole country he said goes far beyond my expectations, and it is a question in my opinion, of a short time only, when capital will be introduced to lend its helping hand to that section, so rich in its mineral resources. It is so seldom, continued he, in substance, with an expression that told of a varied experience, that one actually sees more than has been described in mining matters that is indeed worthy of comment. There are some tremendous bodies of ore in Pahranagat district ranging from 4 to 20 feet in width, that will assay from 40 ounces to 60 ounces in silver, and now and then interspersed with pockets that will assay away up into the hundreds. It is this rich ore that is alone finding a market. The greater portion of the ore is of too low a grade to seek the ore market which Salt Lake City now affords. The work of prospecting has gone on and is going on quite extensively. All the ore is raised to the surface, the richest sorted out, and the balance left. "How much, in your opinion, is there of this low-grade ore on the dump," asked the writer. "At least 4000 or 5000 tons on the dumps that will assay from 40 to as high as 60 ounces in silver without sorting. Some of the veins, or the croppings from them, can be traced for a distance of over five miles in length. There have been numerous locations and relocations made in the last three years. One man, named Geer, a prominent farmer of Pahranagat valley, is the owner of about 16 fine-looking claims, and he works continually from 7 to 25 men in keeping up his assessment work and developing his property. I saw the places where two mills formerly stood, and the place also where one smelter eked out a short existence. The smelter of course could not be made to run on the highly silicious ores of the camp. The mill, however, was said to have run with a little more

success. Wm. Raymond, formerly of the Raymond & Ely mine (that the P. C. M. & R. R. Co. now owns) run one mile there, until through the extra inducement offered by the subsequently named R. & E. mine, he moved his plant to Bullionville. The pan process was said to have been handled there with more success by a Mr. Bidwell, who worked transient ores raw for about 25 per cent of what was contained in them. He, like Raymond, deserted the place with his mill to operate in another part of the State where the assays are said to have run from \$400 to \$500 silver per ton. The principal part of the silver is in the form of sulphurets. The gangue is in white quartz, with specks of black iron and a little copper running through it. I ran across some perfectly barren looking white quartz there, which, to my utter astonishment, ran as high as 35 ounces per ton.

Tuscarora District.

NORTH COMMONWEALTH.—*Times Review*, Nov. 21: Second level—West drift from south drift advanced 25 feet. Winze from intermediate drift is down 26 feet, exposing high-grade ore entire distance; progress for the week, 16 feet. Hoisted 14 cars first-class ore, average assay \$356 per ton, and 56 cars second-class, \$30 per ton. Shipped to railroad 43 tons first-class ore.

DEL MONTE.—Third level: No. 1 raise advanced 21 feet; 18 inches of \$60 ore exposed. South drift from No. 1 raise extended 11 feet, showing 12 inches \$30 ore. No. 2 raise extended five feet; small seams of ore on top. North drift from No. 2 raise advanced 22 feet, with good ore still in face of drift. Seventy-eight cars of ore hoisted.

NEVADA QUEEN.—Second level: No. 1 south drift extended 15 feet; face is looking very favorable, showing some high-grade ore. No. 2 south drift advanced eight feet; seam of ore assaying \$256 per ton.

COMMONWEALTH.—South drift from No. 2 raise advanced 22 feet, following seam of ore 22 inches wide, assaying \$83 per ton.

NORTH BELLE ISLE.—No. 3 north drift, 400-foot level, has been advanced 12 feet; the vein is showing again some ore. No. 2 upraise has been advanced 13 feet and stopped, and stopping commenced. No. 1 winze sunk 12 feet and will again cut the vein in a day or so. North intermediate above 400-foot level advanced five feet, and a short crosscut west has encountered some good ore. Line crosscut on Belle Isle 400-foot level extended 17 feet and stopped for the present. Stopes at north end yielding as usual, and ore is being sacked for shipment to Carlin.

NAYAJO.—No. 2 upraise from south intermediate drift below 350-foot level has been extended up 12 feet. The stopes are producing the usual amount of good ore. Have commenced an upraise above 150-foot level on the west vein.

BELLE ISLE.—The north drift on 150-foot level has been advanced six feet; the rock is still very hard. Line crosscut on 350-foot level advanced 18 feet. Stopes are yielding as usual, and ore is being sacked preparatory to a shipment to sampler at Carlin.

Washoe District.

CON. CAL. AND VA. MINE.—*Virginia Chronicle*, Nov. 21: 1100 level—The west crosscut No. 1, started from the south drift at a point 100 feet south from the shaft station, has been extended 45 feet; total, 380 feet, in porphyry carrying clay separations and lines of quartz. Are stopping out nulling ore between the crosscuts Nos. 4 and 5 from the south drift. 1750 level—In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. Have also extracted some milling ore at the point where the upraise carried up from the crosscut run west from the southwest drift made connection with the stopes on the eighth floor. Have continued to extract ore of average quality at the point where the upraise from the southwest drift 70 feet north from the south line of the California ground connected with the eighth-floor stopes. There has been extracted from all parts of the mine during the week 1000 to 2000 tons of ore, which was shipped to the Morgan mill. The average assay value of all of the ore worked at the mill during the week (980 tons) was \$22.83 per ton. Bullion shipped to Carson Mint, assay value about \$11,531.64.

OPHIR.—1465 level—Have continued our prospecting work near the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level. No ore has been extracted during the week.

MEXICAN.—On the 1465 level the winze started at the end of the crosscut run west from the main north lateral drift at a point near the south boundary line of the mine, 132 feet in, has been sunk 16 feet; total depth, 30 feet, in porphyry carrying quartz of very low assay value.

UNION CON.—On the 900 level the joint Sierra Nevada and Union Con. west drift from the shaft has been extended during the week 34 feet; total distance west of the shaft, 1386 feet, the face being in clay and porphyry.

EXCHEQUER.—East crosscut from the north lateral drift, 150 feet south of north line, 600 level, is out 110 feet; face in porphyry.

WARD COMBINATION SHAFT.—The southwest drift, 1800 level, is out from shaft 166 feet; face in porphyry.

BULLION.—The east crosscut on the north line, 1300 level, is out 345 feet; face in clay and streaks of quartz.

CHOLLAR.—The south drift from incline station, 1500 level, is advanced a total length of 387 feet; face in porphyry. Are making usual amount of repairs on various levels. Extracted and sent to mill in past week 421 tons of ore; average battery assays \$7.05.

ALPHA.—The south drift from winze, 80 feet north of shaft, 550 level, is out 77 feet; face in quartz yielding low assays. The north drift, same level, is out 65 feet; face in clay and quartz. The southwest drift from Ward shaft, 1800 level, is out 166 feet; face in hard porphyry.

UNION SHAFT.—West drift, 900 level, is out west of shaft a distance of 1386 feet, having been advanced 34 feet during the week; face in clay and porphyry.

SILVER HILL.—The northwest drift, 50 level, is out from the shaft 360 feet; face in gypsum. The south crosscut, 160 level, is out from the winze 800 feet; face in hard porphyry.

CON. NEW YORK.—The west crosscut, No. 3,

140 feet north of shaft, 650 level, is out 42 feet; face in quartz, showing bunches of good ore.

BEST AND BELCHER.—1000 level—Upraise No. 1 has been carried up a distance of 11 feet; total height, 38 feet; face in hard porphyry.

GOULD AND CURRY.—200 level—South drift from east crosscut No. 1 has been advanced 20 feet through old fillings of a fair quality; total length, 73 feet.

UTAH.—725 level—At a point 252 feet from the winze station, east crosscut No. 2 has been started and advanced 45 feet in a formation of vein porphyry.

ARIZONA.

DOSORIS.—*Prescott Courier*, Nov. 21: Work in the Dosoris mine is going merrily on, and rich ore being taken out. A drift is now being run from the middle tunnel, on what appears to be a stringer, bearing to the east, ore of which is of the same character and richness as the main ledge. Printer long has discovered a ledge about six miles east of Prescott, ore of which shows considerable free gold. Greenwood, Packard & Co., operators of the Clark & Adams mill, eight miles south of Prescott, are having 25 tons of ore moved to the mill from the Shelton mines on Lyax creek, worked by them under lease. The mill will soon be started and kept steadily going. The Oro Bella mine has never looked more promising than under the management of Col. Spear, its present efficient superintendent. A two-foot vein of \$60 ore has been recently been struck in the lowest levels of the mine, and the outlook for a flourishing mine at that point is most promising.

BRITISH COLUMBIA.

INTEND TO MAKE A TEST SHIPMENT.—*Hot Springs News*, Nov. 11: The owners of the Le Roi, a Tail Creek claim, shipped in a carload of supplies last week, sufficient to carry them through the winter. Ten tons of ore will be shipped to Butte, Montana, for a working test. Four tons were recently stoped from the shaft, about 35 feet from the surface, and from a carefully taken sample sent to Spokane the following returns were had: Copper, 6 per cent; silver, \$2.10; gold, \$60.30; or a total value of \$77.40 per ton.

A TAIL CREEK BONANZA.—John S. Baker of Tacoma and Capt. Ainsworth of San Francisco have purchased a fourth interest in the I. X. L., a Tail Creek claim, for \$5000, and bonded another fourth at the same price. If work that will be done on the claim this winter proves it to be a stayer, a ten-stamp mill will be erected on it in the spring. The ore is free-milling gold and of high grade.

COLORADO.

A STRIKE.—*Elk Mt. Pilot*, Nov. 19: A rich strike is reported from the Black Eagle mine, situated on Sheep Mountain. J. B. Wheeler & Co. of Aspen own the property, and have commenced to ship ore via Carbondale, the road to Crested Butte being closed early, owing to so little traffic over it. A body of ore seven feet wide has been discovered in the east drift from the 1500-foot level, assays from which run from 100 to as high as 500 ounces in silver. If it only holds out, this is the most important strike ever made on Sheep Mountain, and will attract widespread attention to that locality by next spring. A new trail is being made to the mine from the wagon-road at Lizard, so that the route will be somewhat shortened and ore packing will be kept up as long as the season will permit.

DAKOTA.

WELCOME CHLORINATION WORKS.—*Deadwood Pioneer*, Nov. 19: It is learned that arrangements have been made by the Welcome Chlorination Works with the Elkhorn Railroad for the transportation of ore from the mines to Rapid. The rate from Bald Mountain to Deadwood will be 75 cents a ton, the same as is now charged. From Deadwood to Rapid the rate will conform pro rata with the rate to Omaha. This will bring it to 50 cents a ton, and the chlorination works guaranteed to ship ore to such an amount that the minimum cost will be \$12.00 per annum.

SPRUCE GULCH.—Recent developments in this district, which lies only a few miles from Deadwood, have brought it into some prominence. Two good prospects have been opened—one by Cy. Robbins and the other by H. C. Dunn—besides some other mines that are equally prominent. There is in both of the above claims a vein of galena and pyrites, which is intermixed with zinc. The grade of the ore is low, although carrying considerable lead. Besides this, there is some dried ore carrying about 20 per cent, and on account of its proximity to reduction works, the district will prove valuable in the future.

IDAHO.

NEW POWER.—*De Lamar Nugget*, Nov. 19: Three short, quick toots of the mill whistle at 8 o'clock last Tuesday night brought everybody in town to their doors, thinking it a fire alarm. There was for a few moments a splashing through the mud as the people ran for the hose-cart and fire plugs; but it turned out that the whistle was only saying "Hip, hip, hurrah!" to celebrate the hitching on of the big engine to the mill machinery, and the mill started up again, after less than 24 hours shut down, with entirely new power to drive it. The two smaller engines, which had to be run with quick motion, are now retired and the new Corliss now does the same work. The long crosscut tunnel being run to cut the Garfield has not yet reached that vein, but last week cut an eight-inch blind vein of good ore. Arthur Neal, discoverer of the mining district bearing his name, which created such a stir in Mountain Home, has sold two of his claims—the Homestake and Mountaineer—for \$45,000. The name of the purchaser has not been made public. This district is situated some 25 miles west of Mountain Home. Several valuable claims there are owned by De Lamar parties.

BAYHORSE.—*Ketchum Keystone*, Nov. 14: Bayhorse will enjoy a more prosperous season this winter than the little camp city has experienced for several years. A. J. Crook, manager of the C. M. & S. Co.'s mines, is having a road built from the Skylark to connect with the wagon-road at the terminus of the pack-trail, so that he may ship ore

all winter by sleighs. Mr. Crook intends to employ about 30 men at the Skylark, the present force being 65. The inexhaustible Ramshorn will employ a larger force this winter than it has for several years. There are two Post Boy tunnels under contract now that will work about 20 men all winter. The Silver Brick will keep a force of eight or more. Besides the above mines, there will be considerable lease work done. In all, we think it will be safe to estimate that there will be at least 100 men employed. There will be no "draughts" made much before Christmas, so the mines will be worked with reduced forces only three months.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, Nov. 13: Work is going ahead lively on some of the mines, notably the Princess and the Aurora. Both of these mines are on the same ledge at the foot of Tomasa hill, overlooking the town, and their shafts are but a few rods distant from each other. Just now the Aurora is in bonanza, the ore taken out showing free gold in large quantities. The shaft is 170 feet deep and sinking will go on to a depth of 200 or 300 feet more. Both the mine and the mill of the Aurora company are working seven days and nights in a week, and it's the general supposition that the owners, Messrs. Russell & Rhodes, are making money fast. The Princess mine is in some respects the best in the camp; its machinery is more extensive than on any other, and everything done on the property thus far shows the ability of the superintendent, Captain W. H. Rodda, and his thoroughness and attention to details. A visit to the bottom of the Princess shaft showed the Burleigh air drill at work under the direction of foreman Dennis Kane. The drill was at work in a granite dike, but had no difficulty in boring a three or four foot hole in a few minutes. Men are at work drilling in the southern end of the 100-foot level also, and through 20 feet of solid rock the Aurora's men can be plainly heard drilling in their mine. Eight-hour shifts keep the mines and mills running constantly. The mines up on Tomasa hill, several of which are owned by A. H. Butler, are among the best in appearance in Lower California. The ledges are large and distinct, and will some day doubtless be proven rich. The best and most complete mill plant is that of the El Paso company, but there are others in the camp well fitted up and doing good work.

MONTANA.

MINES OF MAIDEN.—*Cor. Montana Mining Journal*, Nov. 18: The altitude of Maiden is 4256 feet. The town has a pleasant location and a better grade of buildings than most mining towns. The mining interests are on the upward tendency. W. H. Burgess has the Maginnis 10-stamp mill leased for eight months. The plant will be used for treating the ore from the She and Last mines. The developments on the She consist of 150 feet of tunnels, from which has been taken about 150 tons of ore of a free milling character that averages \$65 per ton in gold and silver. The Anna B. has a shaft 50 feet in depth, from which has been taken 75 tons of low-grade ore that will pay the expense of developing. The Sheep Mountain and Great Northern make up the remainder of the group that will be worked. Mr. J. Moorhead, assayer for the Spotted Horse company, has secured a lease on the South Mountain, one of the Maginnis mining properties. The ore will probably average \$50 per ton. The air is good and the mine dry, and there is no scarcity of men. The Cave Mining Co. has three claims, the Cave, Golden Gate and Horseshoe Fraction. The Cave is patented and is owned by residents of Fergus county. The Cave mine is so named from a cave 100 feet long and from 10 to 15 feet high and 10 to 20 feet wide that showed galena all through. A tunnel 175 feet long has been run from the side of the hill so as to tap the back end of the cave 12 feet below its surface. One hundred feet of this tunnel is run on an ore body 10 to 12 feet wide which gives 80 per cent of lead and 12 ounces in silver for first grade, the second grade carries 25 per cent of lead, 20 per cent of iron, 8 ounces of silver. The mine is easily worked, two men taking out 15 tons a day. The Wicks coal mine is operated by P. Saunders, who commenced cleaning out the mine the first of October. He is now taking out three tons per day.

NEW MEXICO.

BONDED.—*Silver City Enterprise*, Nov. 20: The Silver Bell mine at Pyramid has been bonded by the Pyramid Silver Mining Co. Supt. Hamilton will put a force of men to work immediately, opening up the property and taking out ore. The mine has a shaft 90 feet deep which shows up considerable high-grade ore, as well as large quantities of medium grade. The Bremen mill has turned out 14 bricks from custom ore in 19 days this month, up to last night, and yet the croakers say there are not sufficient resources in the vicinity of Silver City to maintain a city of large size. Thirty-five tons of ore a day at the Flagler works, a \$7000 brick every day from the Bremen, and still not sufficient capacity for the reduction of our ores, thousands of tons being shipped to Denver, Pueblo, Socorro and El Paso. Every dollar being spent in the county is coming out of our mines and the amount of money in circulation in Silver City is greater per capita than in any town in the west. Dolan & Co., lessors on the St. Louis mine at Pinos Altos, made a strike last week fraught with importance, and of great significance, when considered in connection with the many different limestone areas within a radius of ten miles from Silver City. These men, who are practical miners, with much experience in limestone districts, leased the property with nothing in sight. For six months they have worked faithfully, risking their time, money and labor on their belief in the existence of good ore at the contact. Staking all they had on their opinion formed upon the result of former experience in similar formations, they followed a small seam of iron carbonate, which at a depth of 75 feet opened a chamber of ore, the extent of which is not yet made public. The ore is a heavy galena, assaying 97 ounces silver and 46 per cent lead. The boys have a bonanza in sight.

OREGON.

BAKER COUNTY GOLD.—*Bedrock Democrat*, Nov. 20: During the past 30 days the Democrat has frequently noted the arrival in our city of more

or less gold bullion from the mines adjacent to Baker City, to be sent by the banking institutions to the U. S. Mint for coinage, and yesterday the idea occurred to the reporter that the people, even our own citizens, had but a faint idea of the sum total of the output of the mines, and he concluded, if possible, to make the effort to obtain some accurate estimate of the amount. Application was made at the banks, and the cashiers readily gave the following figures:

Amount of gold-dust and bullion received and shipped by the Baker City National Bank during the month of October, 1891.....	\$38,723 60
Amount of gold-dust and bullion received and shipped by the First National Bank during the month of October, 1891.....	\$8,000 00
Total.....	\$46,723 60

From the two banks \$74,723.60. In addition to this, the Pacific Express Company has shipped from its office in this city many thousands of dollars which did not pass through the banks, and private individuals have shipped more or less away to the mint, that no correct account of can be obtained. It is, however, safe to say that the amount of gold sent away from Baker City within the past 30 days would reach the large sum of \$100,000.

WHITE SWAN BULLION.—*Bedrock Democrat*, Nov. 20: Five hundred and twenty-six ounces of gold bullion in 13 days. That is the output of the White Swan mine, and the amount in dollars is about \$10,000. This large amount of gold bullion, just as it came from the retort, was on exhibition all day yesterday at the Baker City National Bank.

MORE GOLD.—There seems to be a rivalry between the mines of Baker county as to which will contribute the most of the golden product. Hardly a day passes that the Democrat is not able to chronicle the arrival of thousands of dollars from the mines adjacent to Baker City. First, it is the Baisley-Elkhorn and following in rotation as monthly contributors are the Robbins-Elkhorn, the Nelson, the Sanger, Waite Swan, Bonanza and others. Yesterday Mr. Albert Geiser, manager of the Bonanza, in the Robinsonville district, arrived in the city with his valise loaded down with bullion, and soon after he put on exhibition at the First National bank 275 ounces of the precious metal, valued at \$16 per ounce, or \$5400, the result of 23 days' run with a five-stamp mill.

THE CHLORIDE MINE.—The Chloride M. & M. Co. have been quietly working their property at Rock Creek this summer with day and night shifts. There is not less than \$250,000 worth of ore now on the dumps and exposed in the openings between the 100 and 300 foot levels.

WASHINGTON.

CONCONULLY.—*Cor. Seattle Mining News*, Nov. 12: The Lone Star has a 15-foot ledge and the owners have spent \$12,000 on it. It is now closed down while the concentrator is being put in better shape by adding new machinery to test the ore. The contract for the 240-foot tunnel on the Salmon Creek has been completed. The John Arthur, owned by J. T. McDonald, is working constantly on fine silver glance ore. The assessment work on the Lady of the Lake has been completed. Ores from this district are hauled 100 miles and then shipped by rail more than 500, which is proof of their high-grade character.

PALMER MOUNTAIN.—The mines in the Palmer Mountain district are in first-class shape. A new strike of \$2000 ore was made a short time ago in the War Eagle, the ore getting richer with depth. The Ivanhoe, which has reached a depth of 140 feet, continues to ship to Tacoma. The rainbow, bonded for \$100,000, produced \$72 from 1½ pounds of ore. The Buckhorn produces considerable native copper. It is developed to a depth of 120 feet. The Julia has a shaft 100 feet deep and the Frisco 80 feet, both showing good ore. The Dexter is shipping a sulphuret ore to Tacoma. It is owned by Hanly, Dudley and Brown. The latter went to Tacoma last week with a shipment.

BONDED.—*Okanogan Outlook*, Nov. 13: One of the most important mining deals of the season was consummated in this city Monday with the bonding of the recently discovered gold claims on Cecil creek. There are two claims included in the transfer, the Red Jacket and White Face. \$20,000 is the price to be paid for the property on a bond of 12 months. It is currently reported here that Mr. Andrews, who bonded the claims, is representing a syndicate of mining men headed by Jim Wardner, of Coeur d'Alene notoriety. The claims were discovered only about three months ago by Messrs. Redmond and Hedrick, and the only development done was performed by nature, in the shape of a deep open cut where the creek crosses the ledge at right angles. Near the bed of the creek a two-foot hole was sunk on the ledge, which is solid ore and two feet wide. A number of assays were made which went all the way from \$125 to \$371 in gold per ton.

UTAH.

ELECTRICITY APPLIED TO MINING.—*Park Record*, Nov. 21: R. M. Jones, the electrician of Salt Lake, is now doing some figuring on placing mining machinery in the Park which shall be operated by electricity. Mr. Jones says he thinks it is only a matter of a few years until all the leading properties in the camp will be using electricity as a motive power and to light the various stations and drifts.

METROPOLITAN STONE CO.—The Metropolitan Stone Co. is rushing matters in connection with the switch to their quarry. Ground has been broken and the grade is now being constructed. Ties have been purchased and four cars of rails arrived this week. The Ontario drain tunnel is now in about 10,000 feet and is being driven ahead rapidly as the force is now in good driving ground. For a distance of about 60 feet this week the entire bottom of the tunnel had to be cut out and lowered, as it was found on survey to be a trifle higher than the grade allowed.

THE SALTON LAKE, on the Colorado desert, San Diego county, is drying up. A great stretch of the desert which was submerged is now dry, and is covered with a glistening coating of salt. The salt company will resume operations very soon, taking chances on the water coming in again at the high-water season next year.

MECHANICAL PROGRESS.

The Training of Mechanics.

The lack of thoroughly trained artisans in the various trades is one of the greatest drawbacks on the progress of American industry. We have very few apprentices nowadays. Boys usually "pick up" trades. Not one in a hundred of our alleged "masters" of trades of American birth has had any systematic instruction. The most of our best trained mechanics are of foreign birth and learned their trades in foreign shops. The "ironclad" rules of the "Trades Unions" render it impossible for any considerable number of our American boys to learn trades in the regular shops. The result of this has been to create a wide demand that the deficiency be made up by training boys in the rudiments of mechanics in the common schools; and there have sprung into existence many college annexes, where the scientific principles of physics are taught in connection with their practical application.

Every section of the country ought to encourage every movement intended to train our youth in handicraft, and every large city in the Union ought to have one or more technological schools similar to the Sheffield annex at Yale, and the scientific and practical schools at Cambridge, that are under the control of Harvard. A contemporary, in alluding to this matter, makes reference to the magnificent bequest of Mr. I. V. Williamson, a wealthy philanthropist of Philadelphia, who has determined to found a free school for the training of boys in all branches of mechanical business. He will put into the enterprise at the start \$2,500,000 or \$3,000,000, and if the school meets his expectations, or comes near doing so, he will liberally extend and endow it by donations in his will.

Mr. Williamson's plan is not to establish a "Manual Training School" as that term is generally understood and as it is exemplified in many of our public school systems. Such "training schools" come very short of the requirements necessary to turn out such workmen as are sought for and must be had in order to carry on in a successful manner the great workshops of the present day, which are so immeasurably in advance of similar establishments as they existed fifty years ago. The intention of Mr. Williamson is to teach boys thoroughly in the mechanical trades, in order that when they enter upon life they may be able at once to secure employment. He deprecates the tendency of the day to despise hard labor, and thinks that the condition of the laboring class will be immeasurably improved if the workmen are bred up from boyhood to take pleasure and satisfaction in their work. It is with this view that he will establish his school, and the common belief is that he will give a large part of his fortune to place it on a firm basis and secure permanence.

It is to be hoped that when the Stanford University of this State is fully under way, it will accomplish, as a part of its work, the purpose which has been outlined by Mr. Williamson. By so doing he will render it possible to fill our California shops with those who have been "to the manner born," and make useful to themselves and the State thousands who would, under the present condition of things, become a burden to themselves and a possible detriment to the public.

BRIDGES OF RAILROAD IRON.—Old rails bid fair to come into valuable use for a new and most unexpected purpose—the construction of bridges. A bridge of this description (being the third of the kind) has recently been built over the Pequabook river, near Terryville, Conn., which is said to be stronger than a wooden bridge and much cheaper. With the exception of a few special castings and rods, it is built entirely of cast off railroad rails. It is a truss bridge, having a span of 19 feet; the roadway is 30 feet wide, and a sidewalk eight feet wide on one side, the whole being covered with concrete. The bridge rests upon stone abutments, on each of which an iron rail rests and forms "mudsills." Upon these the stringers, which are also iron rails, are laid. Of these there are 15 in the bridge, placed at equal distances of 2½ feet apart. Another rod, or "spindle," across the center, under and at right angles with the stringers, is supported by iron rods depending from the trusses, which also support the bridge. Each of the trusses is formed of two rails, the ends of which are fitted into solid iron castings made of special shape to receive them, and meeting at the center of the bridge are also held together by similar castings, through which the iron rod extends, and braces extending on each side to the end of the spindle give strength as well as rigidity to the structure. Heavy plank covered with concrete forms the floor of the structure.

IRON MELTED BY ELECTRICITY.—We have already alluded to experiments which have been made to melt iron by electricity. It is now reported that Alvin Dings, electrician, of Milwaukee, has just perfected a method by which iron can be so melted at much less cost, and in half the time required by the present process. By the new method the melted iron is secured in a condition much purer than in the old way. This is the process: Electrical connections are made to the anodes in which the iron to be melted is placed. Then a strong current of electricity is sent through the iron forming arcs at each electrode. This produces an intense heat, which melts the iron rapidly.

A RECENT MECHANICAL EXPERIMENT for duplicating a croquet ball by hand in an ordinary wood-turning lathe, proved that the simplest method of turning a sphere consists in placing a square piece of wood against the face plate of the lathe, and holding it by pressure from the tail stock, turning carefully, as near as possible by the eye, then with a lead pencil making a mark around the center of the ball, removing the block from the lathe, and turning it about one-fourth way round, when it is to be replaced in the lathe and light chips taken off until every part of the pencil mark is removed. This brings the ball to a nearly perfect state, which is assured, if possible, by making one more change of center. The special point in this method is that the mark made with the pencil around the center of the ball is a perfect circle, and upon changing the axis of the ball and working to this circle, the perfect circle becomes the perfect sphere.

WIRE NAILS FROM STEEL PLATES.—We learn from Eastern papers that an invention has been introduced by which wire nails can be made from steel plate. It has hitherto been considered impossible to cut wire nails from any other material except wire. The cost of changing an ordinary plate machine to one for making a wire nail is very small, and it is said that the adapted machine turns out nails at the rate of 250 a minute, and that the heading die performs its work better than characterizes the ordinary apparatus. The nails by this method are represented as thoroughly well made, well pointed, and with large heads, and without any indication of splitting. By changing the space block, four, six, eight, and ten penny sizes can be made, and the capacity of the device for wire nails is said to be from 40 to 50 per cent greater than the common wire nail machine.

A HOUSE MADE OF COPPER.—N. Poulson of Brooklyn, N. Y., has had a dwelling-house constructed mainly of copper. It is said to be quite a marvel. It is all of metal, on a light framework of steel, the floors being supported by arches. The walls are composed entirely of large copper plates riveted together with double seams and bound with iron. The cornices, the trimmings, the posts, the railings and the sheathings are entirely of iron. The copper is not polished, but each plate is set in rough-hammered. Each plate makes a panel with the iron linings. In three of these panels brass medallions are set in bas-relief. On the two tall brick chimneys are iron bas-relief work, one figure representing a phoenix. The style is Queen Anne, and time will color the whole structure in a rich copper hue.

A NEW MODE OF FASHIONING COAL-DUST FUEL.—In England, where pitch or other bituminous material is expensive, briquettes for fuel are formed by the use of glutinous or farinaceous matters, such as are obtained from wheat, barley, rye, or other cereals, or vegetables—57 per cent to 95 per cent of coal dust being a suitable proportion. The mixture kneaded, sets in a short time, so that molding under pressure is unnecessary, although the use of molds may be adopted to aid rapid manufacture. It is claimed that the product burns with less smoke than the ordinary briquettes, and is more economical in use. Refuse matter from coal fires, with or without fresh coal, may also be utilized.

CURIOSITIES OF IRON WORKING.—Add carbon to pure iron and it becomes steel. Add a hydrocarbon to iron, and steel itself becomes so extensively modified that its properties are not recognizable. Thus steel may be as soft as pure iron. Add hydrogen in varying quantity and it has the quality of resilience, as in the watch spring, or in the quality of tenacity, as in the knife or razor, or may be given nearly the hardness of a diamond, as in a file. With steel at a low temperature, from 405° to 450° F., edge tools are produced, the color in the yellow shades; from 500° to 525°, various sorts of springs are produced, color, blue; while by heating iron to whiteness and plunging it into water, which is mainly composed of hydrogen, files are produced, or forms even harder.

HARDENING TOOLS.—It is said that engravers in Germany harden their tools in sealing wax. The tool is heated to whiteness and plunged into the wax, withdrawn after an instant, and plunged in again, the process being repeated until the steel is too cold to enter the wax. The steel is said to become after this process almost as hard as the diamond, and when touched with a little oil of turpentine the tools are excellent for engraving and also for piercing the hardest metal.

THE TWISTED WIRE NAIL.—A cross between a screw and the ordinary plain wire nail—is working its way into popular favor, and is believed to represent as great an improvement upon the plain wire nail as that useful invention did over the old cut nail. The twisted wire nail not only crushes the fibers of the wood less than the two other forms of nail, but by its screw shape possesses a much greater holding power than the other forms.

A MUCH NEEDED INVENTION.—A shipping journal says that there is a good opening for an ingenious American to discover, patent and place upon the market an automatic ship scraper for cleaning the bottoms of iron and steel sailing ships when under way. A wide application could be made of a convenient and portable device of this description.

SCIENTIFIC PROGRESS.

Whence Comes Intuition?

The question is often asked—Are there any innate ideas?—any indubitable evidences, on record, of any such functions directly pertaining to the mind or brain. That is—whether the brain is but the instrument of the mind—whether, in its throbbings it thinks, of itself, and thinking retains ideas any more than when the eye sees or ear hears, those organs retain impressions. Mr. John E. Methven, a correspondent of the *Phrenological Journal*, discusses this problem as follows:

It is a question whether the brain is but the instrument of the mind; whether it retains ideas or impressions any more than the eye or ear does.

To me it seems that it is the mind, whatever that is, looking through and permeating these organs, that thinks, sees, hears and retains impressions. If this view be correct, it follows that mind precedes brain, and that the latter is a result, a necessary instrument of mental action, through which the various phenomena of the mind are displayed. This implies that the principle or essence of mind is a separate entity. However that may be, it is true there is something, called mind, which is dependent for expression on the potency of external influence and without which mind has no existence; just as there can be no sound until vibration impinges on the drum of the ear.

Mind so constituted, not unlike the spark evolved, from the concussion of steel and flint, has the power of generating thought; and by heredity, in a measure, conditions being favorable of transmitting acquired—not innate ideas. The limitations of mind, ancient ideas, may be illustrated thus:

Suppose a child born of intellectual parents, were, if possible, isolated from human society until adult age; it is impossible to conceive that such a being so deprived of human association could speak, think, or transmit ideas, save, perhaps, of a vague sort, and that might be doubtful, from the fact that from infancy the brain had been in an inactive, abnormal condition; but more from the absence of the essential elements, as noted, that enter into the constitution of active mind. It is apparent from this view of the question that the unseen something, if non-existent, is at least quiescent until it is evoked by the potency of circumstances and the influence of experience. How these operate is unknown.

It may be suggested that ancestral experience imprinted on the retina may call up dim visions; probably they may do so in some peculiar cases. No one doubts that past experiences in a general way are transmitted and aid human progress. But how rare are the instances of ability or genius in linear descent, as far as can be traced, transmitted from parent to child.

But, on the other hand, it may be asked, What of the musical performances of a "Blind Tom" or of the intuitive calculating powers of a George Bidder, who in quickness and accuracy outvied learned arithmeticians? And what, too, of the amazing knowledge Shakespeare possessed of human nature, seemingly, as it were, by pure intuition? These and like exhibitions of mind, as seen in some departments of art and science, seem to approach very near intuition, or perception come by a mysterious strain of natural differentiation. After all, such instances seem but to imply that there are conditions of susceptibility in the unseen which now and then, from unknown causes, become excited into unusual brilliancy.

While it is pertinent to inquire if there be innate ideas, is it not equally so as to the origin of ideas and faculties, not innate, therefore acquired, and how so? And the inference comes that where there is animation there is instinctive emotion, feelings of pleasure and pain, which it is fair to assume are the initial premonitions of mind. Thus it would appear that life and mind are nearly coeval, and both have risen up by the aid of circumstance and experience as means in evoking inherent forces.

Varied conditions and dissimilarity of experience form character, bringing to the surface inborn powers, as exemplified in the pioneers of civilization, and at the present day in men of commanding intelligence, who are the leaders from low conditions to higher planes of being.

The primitive savage perpetrated indiscriminate attacks on the rights of his fellows. Indeed, might was right until a clearer, higher order of brain taught that such conduct was wrong, in that it destroyed the unity and harmony necessary to human well-being and happiness. Thus the sentiment of right-justice dawned, and has grown to the proportions and forms which the phrenologist has denominated conscientiousness.

In like manner, may it not be that religious sentiment, based on fear of the unseen Powers, has grown? Optimistic views coming into activity that comprehended the higher purposes of life saw only manifestations of love in the universe as in the heartless of spring, in flowers, autumnal fruits, and in the many other blessings of life, for which men reverently rendered thanks and adoration. From simple beginnings the faculty of veneration, in its highest form, as worship for the Great Supreme, may have grown.

So of benevolence, hope, ideality, wonder. There is that in the human mind which addresses nature, thence obtains ideas, formulates

conceptions, looking to life and mind, their origin and phenomena. It asks why do these phrenological indications have a place in philosophical inquiry? The reply is, because they are true to nature, and that such knowledge is instructive in this: "Man, if thou wouldst understand, learn to know thyself."

THE CAUSE OF COKING IN COAL.—At the first glance it would seem strange, but it is nevertheless true, that the physical cause of the coking or fusing of bituminous coal into the form of coke, under a distilling heat, is by no means understood. By some German chemists a test has been made to connect the physical phenomenon of coking with the chemical composition of the coal, especially with reference to the richness of the coal in what is called disposable hydrogen or that proportion of it which is in excess of the quantity required to form water with the oxygen present. Unfortunately for the general acceptance of this standard for the coking quality in coal, it does not correspond with observed results. Neither does the richness of a sample of coke in carbon determine its coking capabilities; for two specimens of coal of practically identical carbon composition will often be found to behave very differently in the retort of coke ovens. If the property of coking does not reside either in the surplus hydrogen or the fixed carbon, it is certainly not to be found in the content of the coal in oxygen, which gives no indication whatever of the physical behavior of the coal under heat. Some coking coals coke without much swelling; others swell considerably in the process of coking. In either case, the coal must undergo a stage of fusion, in which it becomes a thick semi-fluid mass through which the gas escapes. Why one kind of coal should swell considerably while another variety, of similar composition, does not, is a problem not apparently capable of solution from any of the chemical data usually preserved in analyses of coals.—*Journal of Gas Lighting.*

WHAT IS AMMONIA?—The existing war among the baking powder manufacturers, and the consequent newspaper talk in regard to the same, has induced the inquiry among the multitude as to what this poisonous ingredient really is, and why it is poisonous. A contemporary answers this inquiry as follows: Ammonia is the most common and the most easily produced poison there is. It produces itself. It is a product of decay, and is thrown off by the decomposition of all organic matter. Water which contains a large amount of sewage contains a proportionate amount of ammonia. Every cesspool is an ammonia factory. Ammonia was originally obtained from camels' dung, and for ages this was the only source. It may also be produced from putrefied urine. Patents have been applied for with the view of utilizing the refuse from the large stockyards and stables for its production. Ammonia of commerce is now made from gas liquor. The recent discussion of the dangerous qualities of ammonia comes from the alarming increase of its use as an adulterant in certain food productions. People who absorb it in small quantities from day to day suffer from slow ammonia poisoning. Taken internally in sufficient quantities, it eats away the coatings of the stomach and intestines and causes death. Slow ammonia poisoning produces various forms of stomach trouble and causes the complexion to lose its freshness.

SEARCHING FOR A SECONDARY SATELLITE.—The astronomers at Harvard improved the occasion of the favorable conditions under which the late eclipse of the moon occurred, in that locality, to determine if possible whether that orb has a satellite. The search was made by means of a prolonged photographic exposure during the time of totality. An exposure of ten minutes, under the most favorable conditions, failed to reveal any such body. The observatory at Arequipa, Peru, which is working under the direction of Harvard, was instructed to make the same search. As this observatory is most favorably located, and in an almost cloudless region, much interest is felt as to the results at that point.

TERRESTRIAL MAGNETISM AND SOLAR PHYSICS in their relation to meteorology, is to be made the work of a special department in the Weather Bureau. Prof. Frank H. Bigelow, late assistant in the "Nautical Almanac" office, will be in charge. Prof. Bigelow's recent discoveries regarding the solar corona and terrestrial magnetism especially fit him for this post.

A MOST REMARKABLE ALLOY of gold and aluminum is now under the examination of scientists. It is of a beautiful rich purple color. This new royal metal will make a handsome addition to those now used for purposes of adornment. From all accounts, it seems amenable to the methods of jewelers in making their gold ornaments.

THE LAW OF EVOLUTION works in language as well as in other things. Twenty thousand words have been added to the English language in the department of biology alone, since Darwin's discoveries.

VEGETATION IN MINES.—In an English coal mine, plants have grown at a depth of 1000 feet. They were perfectly erect and vigorous; but their foliage was blanched from the lack of sunlight.

ELECTRICITY.

Electricity Made Perfectly Safe.

Have We an Edison on the Pacific Coast?

Novelties in electric engineering come so thick and fast upon us that it requires the constant and closest attention of even an expert to keep fully abreast of electrical progress. Studies in the direction of safe and economic transmission seem just now to be the rule. We have already made allusion to an alleged important discovery in these directions in Oregon. Mr. F. J. Crouch, a young electrical engineer of Eugene, has been for four years engaged in close study and experiment in efforts to devise a perfectly harmless dynamo which, with its connecting wires, any person may handle without fear of danger. He has spent all the money he could command, some \$6000, in these experiments, and, so it is claimed, has at length succeeded in his efforts. The machine is described as being very simple, while the chief secret of success has been found in the winding, induction and proportion of metals. There is another secret which he will not divulge.

Most Extraordinary Tests.

According to the *Oregonian*, Mr. Crouch recently gave his invention some severe tests in the presence of several people, including a reporter of that paper. His principal purpose was to show that his machine was harmless and that it was impossible to get a shock from it.

"Do you think I can do it?" he asked of those around him.

A dubious look crept over the faces of all in the party. No one would volunteer to be the subject of a test, so Mr. Crouch volunteered. Mr. Crouch then took two naked wires from the terminals of the dynamo and placed them in his mouth. If he had fallen dead no one would have been surprised. He kept the wires in his mouth a moment, and, removing them, said calmly that he had not been shocked. The only thing that he felt was a tickling sensation of the tongue.

"Probably there is no power in the wires," one of the spectators suggested.

Mr. Crouch smiled and released a 16-candle power incandescent from its attachment. Then he put the wires into his mouth again, crossed them and connected them with the incandescent lamp and a bright light shone from the globe. Then the inventor placed his hand on one of the brushes and a spectator took hold of the other and the two joined hands. Mr. Crouch broke the current repeatedly, but neither he nor his friend was in the least affected. Mr. Crouch explained that his machine required an absolute metallic circuit or it would not work. Other machines ground and become useless with this kind of circuit. The inventor then wrapped each of the wires around a piece of carbon, and placing his hands around the naked wires brought the points of the carbon into contact. The result was a 2000-candle power arc light, which shone with dazzling brilliancy. Previously Mr. Crouch rubbed one of the wires on a carbon which was connected with the other wire and the first wire melted.

Another feature of Mr. Crouch's exhibit was a 16-candle power light burning in a jar of water, the naked wire being exposed to the water. Right above the jar was a light and an electric bell on the same circuit.

A telephone instrument has been worked a distance of three or four miles on the same line as an electric light without damage to either branch of the service.

Again, the incoming and outgoing wires of the dynamo have been run without insulation through mud, and have then started lights without any loss of power. Mr. Crouch says his dynamo has the power of ten volts. It will run fifty 16-candle power incandescents with 4-horse power, including friction. In inventing it Mr. Crouch says he has cast aside all the theories of construction of electrical machines and started on a new track.

If there is no mistake in this report Mr. Crouch is a full rival of Edison. The last of his tests are directly in line with the latest and most wonderful achievements of the "wizard of Menlo Park," as already described in these columns. The question naturally arises, Have they both struck upon the same device?

A SAFETY WIRE FOR MINES has been devised which does not throw a spark when by any accident the wire is broken. The secret of the invention consists, practically, in transferring the breakage of the wire to some place at the top of the mine, where its action is not important. The wire or cable contains an inner core of closely coiled spiral wire insulated by braid, and an outer core which is joined in parallel with the inner. In case the cable parts, the inner spiral pulls out to a considerable distance and takes the whole onrrent. As soon as the exterior main is broken, the fuse at the switchboard burns out and releases a switch which cuts out the whole current. In case the wire should be completely severed, as by an ax, thus crushing the two conductors together, a small resistance coil is placed in the circuit, and any contact between the two wires causes the fuse to melt as before. The device is especially valuable in coal mines, where explosive gas is occasionally met with.

A NEW ELECTRIC BATTERY.—Mr. John Baldwin, an English inventor, thinks, if he has not found perpetual motion, he has certainly discovered something very near to it.

He has patented a new electric battery, in which, instead of using zinc, he has hit upon a solution which, he claims, is seven times as powerful as the zinc battery. The chief peculiarity of this battery, as claimed, is that its power grows gradually less in a few hours of use, but returns to its original unit when allowed to rest a few hours. Two batteries are so arranged that the power is shifted from one to the other every three hours. Suppose it is desired to run a motor which requires ten units of power, take a battery which, when rested, gives 15 units of power; when use has brought the power down to ten, the current itself operates an automatic device for changing the batteries, and the new one, also of 15 units, is shifted in the place of the weaker one. That, in turn, runs until the power goes down to ten, when the rested one takes its place; so on ad infinitum. Such a machine would certainly come very near to perpetual motion.

THE METROPOLITAN ELECTRIC RAILWAY of San Francisco, to run from junction of Market and Mason to the ocean beach, by way of the Park, will be ready for operation in about three months. It will reach the Park at the Olympic Club grounds, at which point work will cease for the present until further improvements have been made along the sand dunes between there and the beach, and until reasonable arrangements can be made for the right of way through the south-side property. President Mayne says that contracts have been made with the Thomson-Houston Co. to set up the electric plant. The overhead system will be used. As the franchise was granted before the Board of Supervisors passed the ordinance prohibiting the erection of poles and stringing of wires in the district east of Eleventh and Van Ness avenue, the company expects no trouble in this respect. A Golden Gate avenue over-builder has the contract for building the cars. There will be no double enders. The cars will be similar to those used on the Ferries and Cliff House cable road—an open dummy at one end.

LOOKING FOR POWER.—The capitalists of San Jose are just now much interested in the cheapest and most practical way of obtaining an unlimited source of power for generating electricity. The success of the recent mode of long-distance transmission of power, as demonstrated in Germany, in the opinion of some, warrants the attempt of utilizing the distant falls of the Merced river, when there can be no practical limit to the extent of power. Others think that Coyote creek, at Glen Willows, a nearer point, only 20 miles away, will furnish all the power needed, as the watershed which furnishes that power is fully 200 square miles in extent. The sum of \$750,000 will be sufficient to utilize the latter, while a much larger amount would be required for the former. The San Jose Chamber of Commerce favors the Glen Willows project, and has appointed a committee, consisting of Dr. E. A. Clark, A. P. Hill and W. C. Winter, to inquire thoroughly into the matter.

THE OVERHEAD SYSTEM.—The Southern Pacific Company has decided to employ the overhead system for their Telegraph Avenue street-car line in Oakland. Their first inclination was to employ the storage battery systems, but upon the report of agents sent East to look into the matter, have finally decided as above. This is one of the very few horse-car lines still in operation in Oakland, and the citizens of that place will be rejoiced to greet the completion of the coming change. Work upon the road will be prosecuted diligently, even through the winter, until the new system is in full operation. When this road is completed to Berkeley, the double-fare charge between the University and Oakland will be done away with, and five cents only will be required for fare between the two places.

THE NEW TELEPHONE INSTRUMENT, which was recently announced as an invention of a citizen of this State, and which it is promised will work a complete revolution in the whole system of telephoning, seems to be still in abeyance. It is but justice, we presume, to wait for developments, which we trust will eventually prove all that its sanguine inventor and his friends have claimed for it. It will be recollected that "Lukey Baldwin," of this city, was the chief broker of the inventor, and it is to be hoped that Mr. Baldwin's luck will not forsake him in this, his latest venture.

FROM SAN JOSE TO PALO ALTO.—There is serious talk of an extension of Mr. Henry's San Jose electric railroad from Santa Clara to the Stanford University. Such an extension would be of great value to San Jose and vicinity, which will soon be entirely covered with a large population which will be greatly benefited by a close connection with the University.

ELECTRIC RAILWAYS IN PORTLAND, OREGON.—Electricity as a motive power for street railways has been used in Portland, Oregon, since 1889, and an aggregate of some 33 miles of track is now in operation there. In addition thereto 32 miles more of horse railways is either actually being converted into electric roads or is under proposition to that end.

ELECTRIC RAILWAY IN SAN DIEGO.—The entire system of the San Diego horse-car lines has been purchased by A. B. Spreckels. He will at once convert the main portion of the system into an electric railway.

GOOD HEALTH.

School Study and Curved Spines.

There is quite too much inclination among most people to make light of the charge that our school children injure themselves by too much study. This matter ought to be fully set at rest by the following paragraph: At a recent meeting of the Collegiate Alumnae called to consider the question, "Should Physical Training be Required for Girls in Colleges and High Schools?" Walter Magee, Professor of Physical Culture at the University of California, made the startling statement that in a recent examination given by him to a large ladies' school of good physical average, 33 per cent were found to be suffering from curvature of the spine, and 50 per cent had hollow chests and shoulder deformities.

The cause of this deplorable state of affairs is by some attributed to a lack of proper exercise in well-arranged gymnasiums. But those who have inquired closely into the matter think that there is no remedy for this evil except in a thorough change in our educational requirements.

Shoulders are rounded, spines bent and the nerve forces exhausted by overstudy; and some of our girls are even sent to insane asylums in consequence of the pernicious system of cramming so much in vogue.

A correspondent of the *Morning Call*, in commenting on the above, writes as follows:

When students remain at their desks for five hours a day, and pore over their books four or five hours more every night, it will need more than a puny attempt at gymnastics for half an hour daily to correct the harm done them. If the girls were given no home study or even a reasonable amount, they might have time for "recreation" and physical culture if they choose.

It is well known that physical work and mental work are supplied from the same nerve force. At the Stanford University this fact is recognized. Dr. Wood, who has charge of the gymnasium in that institution, says that physical training is elective and counts for a degree as a regular study. Exercise is something, but rest—opportunity for the renewal of the vital force—is more, and this opportunity, as may be seen by the hours required for study, is exactly what our girls have not. The Persians in training their athletes observed this principle. All the exercise they allowed was a moderate walk daily, and even this was stopped for several days before the contest; and while they did not equal the Greeks in mere strength, they excelled in activity and energy.

This is no light matter. If the figures of Prof. Magee are true—and there is no reason to doubt them—it is appalling! Something should be done, and done soon. If this cramming method is destroying our girls at this rate, it should be stopped at once. Nine or ten hours' study a day is more than any one can do to advantage; but even if it were necessary in order to cover the course laid out in the high schools, this would be no excuse.

No amount of culture can repay for a curved spine; no learning compensate for shattered nerves and ruined health.

RELATIVE STRENGTH OF MEN AND WOMEN. By means of a specially devised instrument, a French scientist has carried out some experiments for determining how the average strength of the two sexes compares, says the *Herald of Health*. The palm of the hand is placed on the instrument, and then the greatest downward pressure which the individual can give is exercised upon it, and the force thus produced is recorded by the usual clockwork device. Fifty robust men, and the same number of healthy women, both belonging to the middle class of society, with ages varying from 25 to 45 years, were tested in this way by the Paris scientist. The strongest man of the company was able to produce with his right hand a pressure equivalent to 85 kilograms (a kilogram is rather more than 2½ pounds) and the weakest to 40 kilograms, the average being 56 kilograms. One curious result was arrived at: The short men were all very nearly as strong as the tall men, the average difference between equal groups of two sizes being only three kilograms. The force of the strongest women of the 50 who were selected amounted to only 44 kilograms, and that of the weakest to 16 kilograms, while the average was 33 kilograms.

HEALTH OF THE STATE.—The report of the State Board of Health for October gives mortality reports from 71 cities and towns, having an aggregate population of 700,563. The fatalities during the month were 1077, at the rate of 18.36 per thousand per annum. Consumption was the cause of 153 deaths; acute pneumonia, 67; heart disease, 67; diphtheria, 46; cancer, 40; various diseases of the bowels, 109; all other diseases, 590.

TEA is said to have no ill effect upon the nerves if it is taken weak and cold. To prepare your cup of tea so that it will meet with the doctor's approbation, pour it into your saucer and add a little cool water. The very thought makes you shiver, but it is a good thing to do just the same.

ESSENCE of cinnamon, used as a spray, is found to be very useful in driving out malaria from hospitals and sick rooms.

USEFUL INFORMATION.

MOLASSES AS FUEL.—The Louisiana crop of molasses is about 450,000 barrels annually, and will be a constantly increasing quantity; a larger part of it is of superior quality, which finds a ready market, and the lower grades are constantly increasing; for these lower grades there is now scarcely any market, and their value has fallen so low that the question of the fuel value of such goods has arisen; the lower grades will increase in quantity comparatively, as the more thorough the manufacture of sugar is, the lower the grade of the resulting molasses. Its present market value leaves its value on the plantation at about \$3.33 per ton, which price per ton is about the present value of coal in the East. If it could be demonstrated that such molasses has a fuel value equal to or about to coal, priced for pound, it would quickly solve the problem which is now exciting much attention in Louisiana. The distillation of molasses into alcohol may be a more profitable method for its disposition, but as no experiments have been made in that direction, the sugar producers are in the dark about the matter. Experiments are desired as to the practical and comparative value of molasses for distillate or fuel. It may be asked in this connection what use is being made in this State and elsewhere of the residuum from beet-sugar manufacture.

HORSE-POWER OF WHALES.—Sir Wm. Turner, the present eminent professor of anatomy in the University of Edinburgh, Scotland, has given much attention to the study of whales, their structures, habits, etc. He estimates that the great Greenland whale (average length 50 feet) attains a maximum speed while swimming of ten miles an hour; the "Finer" whale (maximum length 85 feet) often making 12 to 14 miles an hour. Mr. Turner, in one of his lectures, said that he and John Henderson of Glasgow, the well-known builder of the Anchor line steamships, had spent much time in trying to arrive at a satisfactory conclusion as to the horse-power exerted by large species of the whale in making a speed of 12 miles per hour. As a base for their conclusions, they took the size and dimensions of the great "Finer," which was stranded on the shore at Longdridge some years ago. It was 80 feet long, weighed 74 tons, and had a tail which was 20 feet across at the extreme end of its flanges. With these data, Messrs. Turner and Henderson calculated that a whale of the dimensions mentioned, in order to attain a speed of 12 miles an hour, must exercise a propelling force of 145 horse-power.

CHARCOAL IN FILTERS.—Charcoal in filters has been much recommended for its remarkable power for absorbing organic matter. This property renders charcoal, however, whether vegetable or animal, but especially the latter, the most dangerous of all materials for continued use. It becomes saturated with organisms and the matter which they feed upon. It cannot be cleaned except by being subjected to a red heat, which cannot be done in an open atmosphere, and to do it in retorts would be quite too expensive. If used at all, it should be changed every day—an impracticable thing to do. If used for any great length of time, it would be about as bad as a dead cat in a filter. Finely granulated coke with sand might be used instead of charcoal, as with care and patience, coke and sand might be washed quite clean; but it is almost impossible to remove any impurity from charcoal except by fire.

MECHANISM FOR PREVENTING OVERWINDING IN COLLIERIES.—Mons. Remaux, director-general of the Societe de Lyons, has invented an ingenious contrivance for the prevention of accidents in the collieries by overwinding. It is in use in the company's mines at Lens, in the department of Lille, France. The apparatus consists of an arrangement of valves, which come into play directly the cage reaches a certain point in the shaft, and, if the engine should at that moment not be under control, immediately apply a powerful air brake. This, however, allows the cage to proceed at a certain speed. But should another point in the shaft be passed and the engine be still out of control, the brake is increased in power, steam entirely shut off, and the cage brought to a standstill.

A SIMPLE RULE for determining the width and thickness of rubber belting required to transmit a certain power, may be found from the following formula: h. p. multiplied by 155 and divided by speed in feet per minute, will equal the cross sectional area of the belt in square inches; from this it is a very easy matter to ascertain the width and thickness.

FOR REMOVING OBSTRUCTIONS.—At the recent street-car convention, a Pittsburgh inventor showed an appliance he has for placing in front of cars for removing obstructions. It revolves upward from the track and the inventor claims it will bounce human beings with as much safety to themselves as the light touch of a policeman's club.

NEVER START A HORSE WITH A WHIP.—The horse is as susceptible to kind words and kind treatment as any animal, and his faithfulness in man's service deserves more kindness and care than he receives. A good and careful driver will never start a horse with a whip. Teach him to start with the word.



A. T. DEWEY.

W. B. EWER.

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W. B. EWER,..... SENIOR EDITOR

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday, November 28, 1891.

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Passing Events.

The developments in the Hale & Norcross suit now on trial in this city, referred to more at length in another column, go far in proving what the MINING AND SCIENTIFIC PRESS has long maintained, viz., that the mill-owners on the Comstock get what profits should come to the mine-stockholders. A radical change must be made in the milling systems in vogue up there before confidence in the mines can be again restored.

The Supreme Court has rendered a decision that the law appropriating \$300,000 for the World's Fair is valid. The California Commission can now go ahead and make the necessary preparations to have this State suitably represented at Chicago.

Four of the hitherto mining companies of Santa Cruz and San Luis Obispo counties have formed a pool. This is not a paving, but a mining company. The mining of this product in this State has now attained large proportions and is constantly growing. Several new deposits have been opened this year.

Thanksgiving comes to us this year while we are enjoying warm and balmy air and sunny skies. From the other side of the continent come tales of violent storms. If for nothing else, we should all be thankful for the climatic conditions which surround us.

A LONG TUNNEL JOB.—The Marysville Appeal of the 21st says: C. C. Butler of Steep Canyon, who resides between Smartsville and Spenceville, has sold his quartz mine to an

English syndicate, represented by Mr. Higginbottom, for \$31,000. He worked in the tunnel alone for 13 years, and is now repaid for his patience and perseverance.

The Mining Congress.

Our esteemed contemporary, the Denver Republican, in its enthusiasm over the Mining Congress last week, and opening of the new Mining Stock Exchange building, heads its long article descriptive of the events with "Alone in Their Glory—The Only Mining Exchange Building and the First National Mining Congress," implying that Denver alone has these things. The congress is conceded; but as to a Mining Stock Exchange building San Francisco has had one for 15 years past, built especially for a Mining Stock Exchange, to which purpose it is still devoted. It is a fine granite building, elegantly appointed, and cost, with its lot, \$700,000. The main room, one of the finest in the city, is devoted entirely to the business of the mining stock brokers, and the offices are rented to the brokers and mining companies.

On pages 344-345 of this number of the PRESS will be found an abstract of the proceedings of the Mining Congress at Denver. The Colorado papers which have come to hand contain detailed accounts of the procession, speeches, etc., which show that a great deal of enthusiasm was displayed and much interest was manifested in the proceedings. California was honored by the chairmanship in the person of Ex-Chief Justice Niles Searles. Miners from all over Colorado walked in procession in company with mine-owners and mine-brokers, with hands, floats, etc., all representative of the mining industry. The floats were mainly in the line of mining machinery of all descriptions. The procession was nearly a mile long.

The Inter-State drilling contest was the feature of greatest interest to the working miners. There were 23 teams entered for the double-handed contest, nearly all from Colorado camps. One team from Butte, Montana, carried off the prize. The men's names were Page and Reagan. There were 23 teams in the single-handed contest. In the double-handed contest the Butte boys were received with hearty cheers when they mounted the platform and got ready for the fray. They did not look like hinky fellows, but when the gong sounded for the start they proved their abilities as hammermen. Their work in changing, elicited wild shouts of admiration and approval from the thousands of miners present. Each handled the hammer for a minute and then changed to turning the drill and only lost two strokes during the entire 15 minutes. They put down a hole 29 15-16 inches in the allotted time and the audience went wild when the result was announced.

The rock selected was Gunnison gray granite, which is being used in the capitol building, and is counted the hardest obtainable in the State. A solid platform of inch planks was built in the center of the hall, and upon this two huge blocks of the stone were placed—one at each corner. The single-handed drillers had rocks on a lower platform.

In the single-handed contest; D. L. Jones of Clear Creek drilled 18 11-16 inches, the next man getting only 13 1/2 inches in the same time. Full details of the finish of the contest are not yet at hand.

The proceedings of the Congress were mainly confined to the silver issue, and the speeches were all in that direction. Among those who addressed the Congress were Senator Stewart, H. A. W. Tabor and Governor Rontt. Senator Stewart's speech was especially appreciated. Aside from the silver question, the most important subject considered was the Alien Act as it applies to mines and mines on railroad grants. The resolutions on these subjects are timely, and should aid the mining industry as bringing them forcibly to the attention of Congress.

Committees were appointed for the purpose of calling future mining conventions, and it was voted that the next one should be held at Butte, Montana. The Congress was harmonious in its deliberations, and there was much confidence felt that its proceedings will be conducive of benefit to the mining interest.

The unique, new building of the Colorado Mining Stock Exchange was dedicated with due ceremony to the mining interests of the State of Colorado.

Why Comstock Dividends are Few.

The trial of the suit of M. W. Fox against the directors of Hale and Norcross mining company, in which conspiracy to defraud the stockholders of the company is charged, is developing facts that fully substantiate the position of the MINING AND SCIENTIFIC PRESS, that many of the mines on the Comstock are run through the dummy director system in the interest of one or more mill rings.

Five of the directors' testimony shows they only owned from five to ten shares of stock, and had been made directors by others, but for what purpose outside of drawing their pay for attendance at each meeting of the directors, they professed profound ignorance. In their testimony they admitted to a lack of knowledge as to how the mine was run and how the ore was milled, and also that there were no safeguards or checks in the interest of shareholders against any fraud, if desired, in milling the ore. Their knowledge of the work in the mine and ore milled, cost, assays, etc., was confined entirely to the reports of the superintendent of the mine.

The testimony of Alvinza Hayward, one of the owners in the Nevada Mill and Mining Co., showed that the company had never paid any dividends and that there was in his possession \$60,000 of undistributed profits. He also testified to no knowledge of three outside pans that, it is claimed, are run on Hale and Norcross tailings and slimes. The mills were run by Capt. Overton, and he thought were in safe hands. W. S. Hohart's testimony was of similar character to that of Alvinza Hayward.

The third day of the trial more interest developed in the suit, as was evidenced by a largely increased attendance of attorneys, mill and mining men. The most important testimony brought out was that of Evan Williams, superintendent of the Nevada Mill & Mining Co. According to the Examiner's published proceedings of the case, Mr. Williams explained the process of handling the bullion after it was extracted from the ore. Under the regulations of the Carson Mint not more than 10,000 ounces could be deposited on any one day in the name of any one person. Frequently bullion was deposited in the name of Giverich & Bryson, saloon-keepers of Carson, and more frequently in the names of Messrs. Peters and Brown, two young clerks of the Bullion Exchange bank, of which the witness was vice-president. All the depositing was done by the witness. He stated he took a wagon, drove to the Carson Mint and deposited it in the names of several parties on account of Hale & Norcross. In a long series of questions as to why assays the information was elicited that the mine had no representative at the mill, that the tank-shovelers took the assays, and they were merely laborers at \$3 per day.

Then Mr. Williams testified that there were in the mill three slow-motion pans, which are located in a little building, added to the main building after it was built. The pans are run for the benefit of the mill company, and hold about a ton and a half to the charge, and work three charges each per diem, equivalent to 13 1/2 tons a day. The proceeds of the pans are turned over to the mill company. Mr. Williams said: "I take the bullion and weigh it. The foreman of the mill keeps the account, but I don't think keeps any books. He calls this the tallings bullion. At the Mexican mill we have two slow-motion pans worked on the same principle as at the Nevada—sulphurets and alimes together—and the proceeds of the bullion are turned over to the owners of the Mexican mill."

It was shown by Mr. Williams' testimony that no account of the output of the two mines was kept. The foreman had charge of the pans, and he sent the bullion to the James assay office at Gold Hill, where it was run into bars and shipped to the Mint at Carson, the Bullion and Exchange Bank in all cases handling the metal. The information was brought out that the cashier of the Bullion Bank is the chief clerk of the Carson Mint, and as the Superintendent is frequently absent, has full charge. The main part of Mr. Williams' examination was devoted to extracting a description of the interior of the Nevada mill and the three-pan annex into which the slime tanks lead. It was learned that there was a chute leading from the main building into the annex, with a little car-track on the side, in close con-

nection with the three-pan building, and that from the box into which the rich sediment which settled from the run-off slimes, it was a very easy matter for any employee to ladle out with a miner's dipper stuff worth \$30 a pound into the three pans, conducted as an adjunct to the mill company, for its exclusive profit, because presumed to be tailings.

During the examination, the plaintiff introduced in evidence a photograph representing a workman of the Nevada mill with a large dipper scooping out of the sand vat rich tailings from the Hale & Norcross ore, and then dropping them into the "hole in the mill," to be worked over for the benefit of the mill directors. The "man with the dipper" was identified by Mr. Williams as a workman in his employ at the mill, named Fillicon. The dipper itself was admitted to have been used in the manner and for the purpose stated.

The case is still on trial, and it is alleged that testimony of a far more damaging character will be brought out at an early day by the plaintiff.

A Miner's Convention.

Although the representatives of most of the other industries of this State meet from time to time to consider their joint interests, the miners of California have never banded together to consider the subjects affecting the industry to which they are devoted. Of late, however, they have made up their minds to be heard. The first steps were taken in Auburn, Placer Co., and a preliminary meeting was called on Wednesday of last week. The Placer Argus states that the meeting was called to order by Hon. J. A. Filcher, who read the responses which had been received to the circulars sent out. They were all of an encouraging nature, showing that the question of a miner's county convention for the near future met with a hearty approval. After the reading of these encouraging words, Mr. Filcher called for the nomination of a chairman for the evening, when Hon. J. H. N. F. was nominated and unanimously elected. Mr. N. F. made some stirring appropriate remarks, thanking the audience, and asked for the nomination of vice-president and secretaries. John Spaulding was chosen to fill the chair of vice-president, and Hon. J. A. Filcher and W. W. Rodchaver to perform the work of scribes. Interesting short addresses were made by Mr. Hartley, Dr. Schnabel, J. B. Hobson, Judge Hale, Mr. McHale, Judge Spear, Hon. W. D. Perkins, Justice Stevens, R. F. Burns and others, and throughout the meeting was one of thrilling interest.

A committee, composed of J. B. Hobson, Justice Stevens, Dr. Schnabel and the Secretaries, were appointed to draft a preamble and resolutions to be embodied in a call for a Miners' County Convention, to be held in Auburn at the earliest day practicable, and they reported the following, which was adopted:

Whereas, The history of California of late years has been a history of oppression to the mining industry, the people being educated through a portion of the press that mining is vandalism and that miners are vandals, and

Whereas, the courts have gone so far as to decide that mining cannot be pursued even where it does not result in injury to others, and

Whereas, The rulings of the Land Offices have rendered it almost impossible to secure further patent to mining claims, and tend to the withdrawal of the mineral lands of the State from location and exploration, and

Whereas, A corps of competent Government engineers, after a careful examination of the situation, have reported that it is practicable to construct works that will enable mining to be continued without injury to other industries, and

Whereas, By a complete restoration of the mining industry in California, the gold output of the State and the revenue of the country would be increased from ten to twelve millions a year, according to the length of the rainy season, and

Whereas, In the face of these facts, the miners, long suffering and slow to anger, have remained inactive, believing in the justice of their cause and trusting that the Government would see their wrongs and right them, and

Whereas, Instead of remedial measures being proposed, they see and feel the bands tightening around them, and

Whereas, They are convinced that further indifference to these growing evils means the complete ruin of the miners as individuals and death to the mining industry; therefore be it

Resolved, That in view of these facts, the time is overdue for the miners and all others interested in the mining industry to rise and assert their rights and organize in defense of their interests and their homes. To start the ball rolling in the direction of organization, it is further

Resolved, That a Miners' Convention be, and the same is hereby called, to meet in Auburn on Saturday, Nov. 28th, at 1 o'clock P. M., for the purpose of further considering the evils that are hampering the mining industry and preparing the way for a Miners' State Convention with the view of concentrating our voice as to make it heard in the halls of legislation, the departments of the Government and the courts of justice.

Resolved, That the miners of Placer county and all other interested in mining, are hereby called upon to take hold of this move energetically and exert themselves each and all, to one waiting for another to see that their several localities are fully represented in said Convention.

Resolved, That the representation in said Convention be limited to five delegates from each voting precinct in

Placer county, and to such mining men from other counties as may favor the Convention with their presence.

Resolved, That each precinct in Placer county be and is hereby urgently requested to send to said County Convention the full representation to which it is entitled.

Resolved, That these resolutions be published in the papers of Placer county, and that all other papers in the State friendly to the mining industry be requested to publish the same.

J. H. NEFF, Pres.
JOHN SPAULDING, V. P.

J. A. FILCHER,
W. W. ROBBINER,
Secretaries.

At the close of the meeting the Auburn people present met and elected delegates to the said Miners' Convention as follows: Precinct 1, Gen. Jo Hamilton, J. A. Filcher, D. W. Spear, P. McHale and B. F. Hartley. Precinct 2, John Spaulding, J. B. Patterson, J. B. Hobson, E. C. Uren and T. B. Everett.

The principal idea of this county convention is to formulate a plan for a State convention, mainly for the purpose of organizing a miners' association and memorializing Congress as to needed legislation for the mining industry of California. In all probability, should a State convention be called, it will be held in San Francisco, the most suitable place for it. The miners of this State have many grievances to which public attention should be called, but nothing can be accomplished by desultory action. United effort will do a great deal if properly directed. We hope to see the State convention called.

The Freezing Process in Shaft-Sinking.

The difficulties connected with sinking shafts when large bodies of quicksand and drift are met with, have to be occasionally, encountered and overcome, in many localities. The Petsch "freezing process" is intended to overcome these difficulties. It was first applied in this country at the Chapin mine, Michigan, and the *Engineering News* describes the system adopted there. The engraving quite clearly shows the application.

The owners of the American patents, the Petsch-Scoy Smith Freezing Co., contracted to freeze, excavate, and open up a rectangular shaft $15\frac{1}{2} \times 16\frac{1}{2}$ feet, and about 100 feet deep to the ledge. The mining company put the freezing pipes into the ground 3 feet apart, in a circle 29 feet in diameter, and, with the exception of two of the pipes, to the ledge. This proved to be a difficult task, on account of the many boulders encountered. A 10-inch casing pipe with flange joints was first drilled down by various means, a drill being worked within the pipe when necessary, and the material removed by jetting or by a sand pump. The casing pipe being once down to the ledge, a freezing pipe was placed inside, and the outer casing pipe drawn up and used for the next pipe. The freezing pipes left in the ground were 8 inches in diameter, the lower ends being closed.

Inside of these 8-inch pipes were placed pipes $1\frac{1}{4}$ inches in diameter, open at the bottom. These inner pipes, as well as the outer pipes, were connected together at the top of the ground, as shown in the illustration, forming a complete circuit, through which a cold brine was circulated.

The brine used was a solution containing about 25 per cent. of calcium chloride, which has a very low freezing point. The brine was cooled with a Linde ice machine, made by F. W. Wolf, of Chicago, having a refrigerating capacity of 50 tons of ice per day. The ammonia was compressed to about 135 lbs. per square inch, and cooled by passing through coils immersed in water kept cold by pumping from a brook. Then the ammonia was allowed to expand through coils immersed in the brine, and finally returned to the compressor.

The temperature of the expended ammonia was such as to cool the brine to a few degrees below zero Fahrenheit. This brine being circulated through the ground pipes, was raised in temperature about 2 deg. Fahr. After 40 days' freezing, an ice wall 10 feet thick was formed around the shaft. The excavation—commenced soon after starting the ice machine—had in the meantime reached a depth of 40 feet. Thirty days more sufficed to reach the ledge.

The shaft was for convenience, curved as the excavation proceeded. This was, however, not necessary, as the walls would have stood vertically throughout the whole depth very well. The temperature of the air within the shaft was generally below the freezing point, and there was no indication of the exposed material thawing. The curbing was made of horizontal

sets of timbers, 16 inches square, placed two feet apart, with 4-inch vertical plank behind the timbers. The cross walls were placed in afterward.

The timbering was supported from one set to another by bolts placed near the corners of the shaft, the whole system being suspended from cross timbers at the surface of the ground. The unfrozen area within the shaft grew less as the actual running time of the freezing machine increased. When a stratum of boulders was encountered, the frozen area reached nearly across the shaft; but when quicksand containing a large percentage of water was passed through, the unfrozen area was greater. The reason of this is readily understood when it is remembered that the specific heat of water is about five times as great as that of any of the other materials, and, therefore, the strata containing most water would require more cold and would be longer in freezing.

The frozen quicksand resembled sandstone. The corners of broken pieces were hard and sharp. Granite boulders embedded in it showed a decided tendency to fracture across rather than break loose. The tensile strength of the frozen ground, as determined by a cement testing machine, was equal to that of the best neat Portland cement, and varied from 350 to 450 lbs. per square inch; and its strength

against crushing, as determined from inch square cubes, was 850 lbs. per square inch.

This furnishes data from which the strength of the surrounding frozen wall may be computed as an arch. An ice wall ten feet thick will be found sufficiently strong for any case likely to occur. Near the bottom the freezing extended within the circle solidly to the center. It is not known how far it extended outside, as no borings could be made through it. A test pit was sunk outside the shaft as far as the water would permit (some 22 feet), and from this it appeared that the freezing extended outwardly from the pipes at that point about 13 feet.

The material was mostly loosened by picks and chisel bars. Black powder was used for blasting for a considerable time, but this was discontinued for fear the concussion might injure the pipes or fracture the wall. The material was hoisted out by an iron bucket, which also took out the water which stood in the unfrozen center. There was no appreciable inflow of water until the excavation had reached nearly to the ledge.

On reaching the ledge it was discovered that it was so fissured and disintegrated as to allow water to come in under the frozen wall, at a corner in the vicinity of one of the pipes that did not extend to the ledge. On 20th Febru-

ary, the incoming stream had so worn a channel as to permit a jet of sand and water three inches in diameter to enter.

The shaft was allowed to flood, water being pumped into it at the same time, to prevent as much as possible the flow of water through the opening.

An eight-inch freezing pipe was put in place in the shaft, the foot being directly at the opening, the purpose being to freeze the leak off.

Cold brine was circulated through the whole system of freezing pipes for ten days uninterrupted, when the water was pumped out, and the seam was found to be quite closed; but there was still a small amount of percolation through the ledge, requiring occasional pumping to clear the shaft; ice had collected several inches thick on the side of the shaft and several feet in the corner, where the extra freezing pipe was placed.

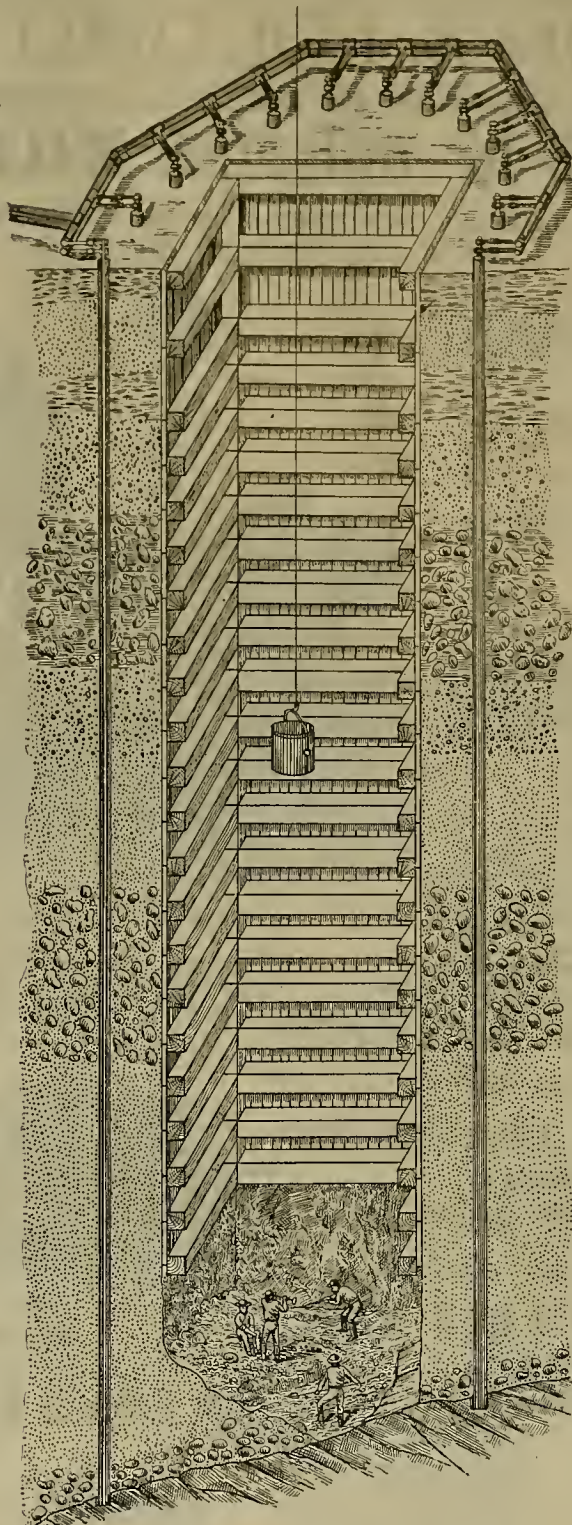
The work of removing the sand which had come in with the water and the clearing up of the bottom continued for two weeks, when the water from the ledge increased at such a rate that it was decided to lay short auxiliary freezing pipes against the leaks and freeze the ledge itself. This was done, the shaft was flooded again, and the brine was circulated 30 days. When the water was pumped out, the leakage was found to be small and the excavation was proceeded with. The soft, shaly rock was removed until a hard bearing was obtained for the timbers, and the timbering was completed from the surface of the ground to the excavated depth.

Water is the engineers' most troublesome enemy, and the conversion of this subtle foe into a barrier of defense is a triumph of engineering as effective as it is novel. This process can be applied to excavations for bridge piers, to tunnels, and to other general work of a difficult and expensive character, as well as to shafts. But in shaft work alone it should be invaluable, as by it numerous valuable deposits of coal and other minerals, now inaccessible on account of overlying strata of water-bearing materials, can be reached, as in the case of the Chapin mines, and in those Belgian coal mines which first led Mr. Petsch to launch upon the engineering world his startling but very efficient process.

Now for the World's Fair.

In Sacramento on Tuesday afternoon, the Supreme Court rendered a decision declaring the Act appropriating \$300,000 for the World's Fair constitutional, consequently this money will now become available for the purpose of making a California display at the Columbian Exposition. The bill making the appropriation provided for the appointment by the Governor of one Commissioner from each Congressional district, making a Board of seven Commissioners, and the following were selected: Irving M. Scott and James D. Phelan of San Francisco; L. J. Rose of Los Angeles; Thomas H. Thompson of Tulare; Robert McMurray of North San Juan, Nevada Co.; A. T. Hatch of Solano Co.; and John Daggett of Shasta Co. The Board organized by the election of Irving M. Scott, Pres.; James D. Phelan, Vice-Pres., and Thomas H. Thompson, Sec'y. Offices were at once secured at 59 Flood Building of this city, and active operations were commenced at once, but were arrested by the refusal of the Comptroller to audit the bills until the Supreme Court passed upon the constitutionality of the appropriation. This has now been done, and the funds are available.

There has been some doubt as to the wisdom of making such a large appropriation as \$300,000 for this purpose, but it is too late to urge that view now. The money will be spent, and the public duty now is to rally to the support of the Commissioners and to cooperate with them, to the end that the money shall be wisely and economically expended for the advantage of the whole State. There will no doubt be great pressure exerted by a throng of visionaries and swells to expend the money upon all kinds of frills and wild-cat schemes beneath the dignity of the State, and not calculated to advance her interests. To successfully meet these, there must be the pressure of better kinds, consequently we urge upon all legitimate interests of California to give due attention to the matter and prepare to act intelligently. We believe the Commission desires to make the very best possible use of the money entrusted to it, and it should feel that the people expect this and will earnestly support and advance its efforts in this direction.



THE FREEZING PROCESS IN SHAFT SINKING.

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A SPECIALTY.

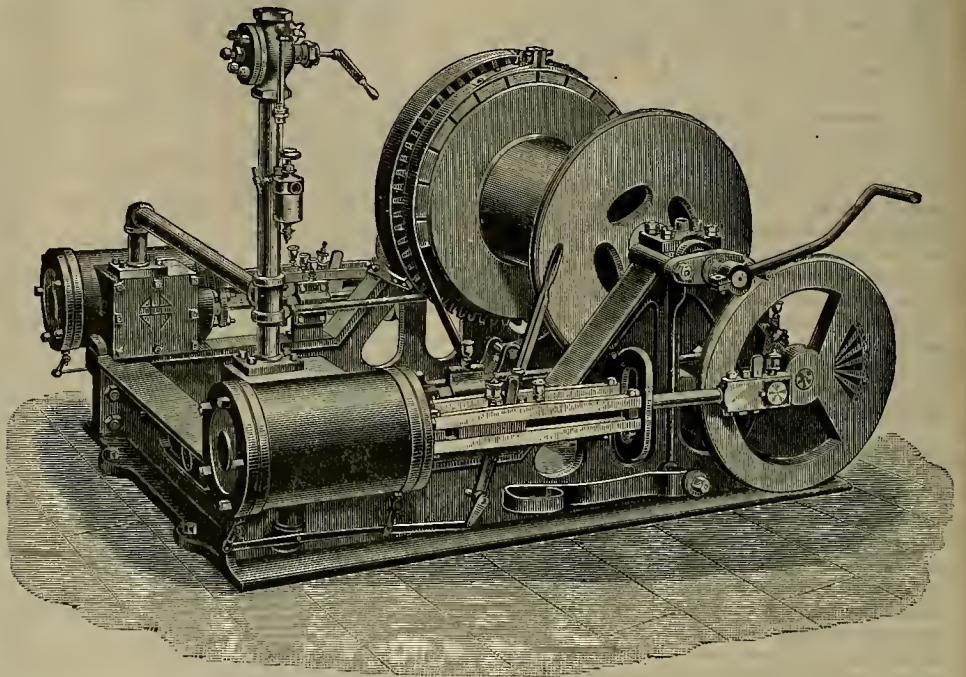
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Improved

FRICTION HOISTING ENGINE

With or Without Adjustable Foot Brake.

This engine is specially adapted for contractors, railroads, quarries, inclines, small shafts, bridge building, docks, warehouses, lighters, barges, coal yards, ice houses, pile driving and general hoisting, where boiler is detached and connected by steam pipe, or compressed air may be used. They have double cylinders, friction drum and two balanced crank wheels, and, if desired, extra, are provided with adjustable hand foot brake, lined with hard maple blocks. Fixtures are same as with single cylinder engines.



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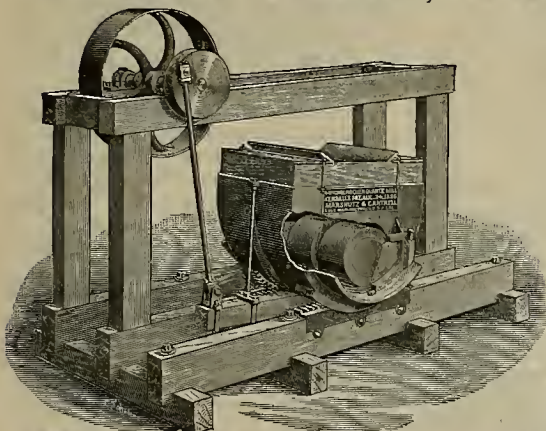
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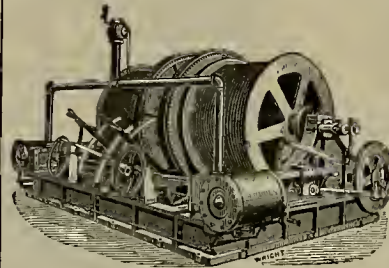
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Bituminous Rock.

Four bituminous rock mines, which furnish material for street paving, are now owned by one company, a consolidation having been effected. Two of these mines are in Santa Cruz county. One is the Walrath, formerly owned principally by ex-Senator Walrath, and the other is the Thirber, whence the Pacific Paving Co. obtained a part of its supply of bitumen. These mines are the same deposit, the two quarries being separated by a fence.

The other two quarries are in San Luis Obispo county. One, the Adams or Fairchild quarry, was the source of supply of the Southern California Bituminous Co., and the other, the Neuvel, was mined by the Pacific Paving Co.

The company formed to operate these mines is called the Bitumen Consolidated Mining Co., and the stockholders are interested in three large paving companies, the Santa Cruz Rock Paving Co., of which A. Walrath is president and Geo. M. Perine is manager; the Pacific Paving Co., of which A. C. Bassett is president and J. H. Swift is vice-president, and the Southern California Bituminous Co., of which J. A. Fairchild is president.

The officers of the new consolidated company are A. Walrath, President; A. C. Bassett, Secretary, and J. A. Fairchild, Manager.

Secretary Bassett was for many years Superintendent of the Coast Division of the Southern Pacific Company.

The consolidated company will not engage in the business of paving. The paving companies will remain in business as before the consolidation was made. The only business of the consolidated company will be to mine the bituminous rock and sell it to paving companies.

Mr. Bassett said also that increase of the price of the bitumen pavements is not contemplated. The intention is, however, to concentrate the mining business at one place, and hence, either the Santa Cruz quarries or the San Luis Obispo quarries will be closed.

The quarries that will be operated will be the ones whence the rock can be most economically obtained, the quality being exactly the same. At present the cost of shipment from the San Luis Obispo quarries is less than from the Santa Cruz quarries, though the distance is four times as great.

The San Luis quarries are on the line of the narrow gauge road, that has an ocean outlet at Port Harford. At Santa Cruz, they have to haul quite a distance in wagons.

The Ventura and Santa Barbara deposits are not in the pool. The rock or asphaltum from the two latter counties is superior in quality, by reason of the percentage of fixed bitumen, to those of Santa Cruz or San Luis. The big deposit at Ventura is not now being worked. The two deposits some seven miles north of Santa Barbara produce the best yet turned out in this State and are being actively worked. The immense deposits of Kern county have shipped some asphaltum this year, but are not yet properly opened. When they are, they may be able to give a cheaper product than many of the mines of the coast counties. It is all a question of freight with these deposits, one costing about as much as another to work at the mine itself. This industry is a rapidly growing and prosperous one.

MINING TIMBERS.—When we contemplate the thousands upon thousands of mining timbers that are annually hauled down from the mountains and used in our mines, we are forced to the conclusion that some day the demand will exhaust the supply. Only a few years ago our mining timbers were obtained only eight or ten miles above the mining belt; but now they are brought 25 or 30 miles, and even at that distance there is a struggle among contractors to see who can get those which may be arrived at with the least inconvenience. At the same rate our timbers have been used during the past ten years, it is safe to say that within the next ten years timbers for this mining section will have to be hauled 40 miles, unless the supply can be brought from other sections than the mountains east and adjoining us. This will render mining so expensive that our low-grade mines will have to be abandoned before they are worked out, unless they can be operated with fewer timbers, or the mode of transportation be changed beyond the use of mule teams. It is about time for some active mind to begin think up some mode by which our miners can be supplied with timbers after the next few years.—*Amador Dispatch.*

Placer Claims.

Their Titles Threatened by Recent Rulings.

The recent rulings of the Land Department in contests arising between agricultural and mining claimants are fraught with danger to the mining industry, says the *Nevada Transcript*. The Department, both in the local and general Land Offices, announces the rule in such contests to be that the miner must show that the lands he is claiming possessed a known, present, actual value for mining purposes; that is, that mere speculative value will not defeat the claim of the agriculturist, and unless the miner can show that his land contains gravel or other deposits from which there has been extracted, or is being extracted, gold in paying quantities, its mineral character is not established.

It must be apparent to all that under such a rule the holders of undeveloped placer claims are placed at a very great disadvantage.

In portions of Nevada county, as well as in Placer, Sierra, El Dorado and other mining counties, many claims which are at present undeveloped are being held by miners.

Not a few of these claims are known to be underlaid by old river channels, in the effort to develop which many years of labor and thousands of dollars have been expended, yet the owners have been unable to demonstrate that they possessed a "known present value" for mining purposes.

It is commonly known in the mining sections that the expenditure of years of labor and thousands of dollars frequently fail in proving the real value of the ground, so far as determining it by actual results is concerned, while at the same time the claim, when opened, may prove extremely rich. Numerous examples exist where miners have spent a lifetime in a vain effort to develop a given gravel claim, yet when they have finally abandoned the undertaking as hopeless, some other party or company has come along and in a short time accomplished what its predecessors were utterly unable to.

Under these conditions, it is plain that until more favorable legislation can be had it is advisable that parties holding claims of this character at once proceed to take the necessary steps to obtain a Government title.

Under the law as it now exists, the miner can take preliminary steps in this direction without being obliged to pay for the land at the time of his application. After having made the application and proofs, he may delay payment for an almost indefinite period, and still be protected as against the claims of others.

In a recent case from this township, it was held by the Sacramento Land Office that the mineral claimant having failed to prove "that the land in controversy possessed a known, present, actual value for mining purposes, could not recover."

It frequently occurs that the surface of placer mining claims is also valuable for agricultural purposes, and especially where the lands can be irrigated; hence it follows that the agriculturist has little or no difficulty in proving the agricultural value of the land, while the miner is at the disadvantage of being compelled to prove that the land contains mineral in paying quantities; or, in the event it is believed there exists an old river channel beneath the surface, of proving that such channel contains gold in paying quantities. In such a contest, with the miner laboring under such disadvantages, it is but little wonder that in the end he finds the claim upon which he has perhaps spent the best years of his life and all his hard-earned savings awarded to the agriculturist.

A CELEBRATED CASE.—United States Circuit Judge Pardee, at San Antonio, Texas, has rendered a decision in the celebrated ore seizure case, recently reviewed by him in an appeal taken by the Secretary of the Treasury from the United States Board of Federal Appeals of New York City. By to-day's decision the action of that board was reversed, and the case will now be tried on its merits in the Federal Court here. The case involves the whole mining industry of Mexico and the result is awaited with much interest.

RECENT EXPERIMENTS in England have shown that an electric light, when turned vertically toward the sky gives most extraordinary results. For instance, the light of the Eddystone light-house can be seen only 17½ miles on a clear night, but a vertical beam of light of far less power is visible just twice as far, with a strong chance of its surmounting an ordinary fog. This discovery will probably bring about a decided change in the manner of placing the electric light in light houses.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their *SCIENTIFIC PRESS* Patent Agency (S. F.) from week to week and year to year.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 17, 1891.

- 453,435.—GAS ENGINE—Barrett & Daley, S. F.
453,436.—VALVE GOVERNOR FOR GAS ENGINES—Barrett & Daley, S. F.
453,476.—BUCKLE FASTENER—F. A. Blackburn, Bisbee, A. T.
453,440.—BIT STOCK—W. Cameron, Milpitas, Cal.
453,272.—HUB AND AXLE—W. W. Flewelling, Kingsburg, Cal.
453,354.—CULTIVATOR AND WEED CUTTER—E. S. Gerow, Lafayette, Cal.
453,578.—WASH BOILER—E. W. Giddings, S. F.
453,353.—DOCK SCRAPER—John Hackett, Oakland, Cal.
453,354.—SACK HOLOER—W. F. Jeans, Woodland, Cal.
453,355.—WAGON JACK—W. Leavewood, Sacramento, Cal.
453,524.—DEVICE FOR TAPPING MAINS—M. P. Madden, Coronado, Cal.
453,367.—FUMIGATOR—W. Martin, Glenwood, Cal.
453,453.—MAIL WAGON—R. R. Richardson, Portland, Or.
453,178.—FRUIT GATHERER—R. B. Vanderburg, Long Beach, Cal.
453,258.—RAILWAY RAIL-JOINT COUPLING—Geo. Weeks, East Oakland, Cal.
453,239.—PICK—Wm. Wilson, Pine Grove, Nev.

The following brief list by telegraph, for Nov. 17, will appear more complete on receipt of mail advices:

- Frank H. Fischer, Oakland Cal., water tank; Carroll E. Oate, Oakland, basket; Albert M. Grubbs, Forest Grove, Oregon, railway switch and railway frog; William Jones, La Grange, Oregon, feeders for heaters; R. A. McVitt, Snohomish, Wash., tool for miners' blast-ers' use; Dr. F. Oliver, Oakland, assignor to Truman, Hooker & Co., San Francisco, dirt scraper; Caleb B. Page, Tacoma, Wash., dumping car; John E. Read, Los Angeles, agricultural machine; John G. Rollins, Forest, Cal., building material; Adolph Summer, Berkeley, Cal., removing free hydrochloric acid from sulphochlorides; Hawden Swain, San Francisco, printing press; George Y. S. Wade, San Francisco, figure toy.

NOTE.—Topics of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DOCK-SCRAPER.—John Hackett, Oakland, No. 453,353. Dated Nov. 17, 1891. This is an implement specially useful for clearing out the mud, which accumulates beneath hydraulic lift docks and other confined spaces of similar nature. In hydraulic docks the foundation is sufficiently low to admit of a platform, which is lowered so that the vessel can be floated into the dock above it and upon which the vessel is afterward lifted out of the water. This space above the bed or foundation timbers of the dock is liable to become filled with mud and other substances, so as to render it in time impossible to lower the platform as much as is necessary to admit larger vessels. The contracted space, which is also a considerable distance below low-water mark, makes it almost impossible to clean this mud out and keep the dock free from it. Capt. Hackett designed this machine, which he has successfully used at the hydraulic dock of the Union Iron Works in effectually and rapidly clearing out the mud under the dock. It consists of a scraper with a means for reciprocating it beneath the platform of the dock, and a gate or door, which is held open while the scraper is passing to the inner end, but which is closed, so that when the scraper is again drawn out it brings a load of mud with it. The hydraulic dock at the Union Iron Works covers a space of 450 feet long by 65 feet wide, but the work was carried on and the dock entirely cleared of mud without in any way interfering with its operation and without interruption of the cleaning operation, except at times when vessels were being taken on or left off from the dock.

SACK-HOLOER.—Wm. F. Jeans, Woodland, Volo Co. No. 453,354. Dated Nov. 17, 1891. This is a novel device for holding sacks so that they may be filled with grain or other material. It consists essentially of a means for clamping the mouth of the sack upon a holder by which it is held open and then released from the holder. By the construction adopted for the holder, the entire circumference of the top of the bag is gripped by the clamp, and the bag is thus held up clear from the floor beneath. No undue strain is brought upon any one part of the bag, and it is allowed to stretch so that the corners and all parts will be well filled.

CULTIVATOR AND WEED-CUTTER.—Edward S. Gerow, Lafayette, Contra Costa Co., assignor of one-half to C. L. Maxwell, Oakland, No. 453,352. Dated Nov. 17, 1891. This apparatus is designed especially to eradicate weeds and loosen up and cultivate the ground, and it consists of a framework loosely pivoted together, so that the parts may be shifted with relation to each other similarly to those of a parallel ruler, and by this construction the cutting-blade or cultivator may be thrown to one side or the other of the main frame, so as to reach parts of the ground at a considerable distance therefrom.

WAGON-JACK.—Wm. Leavewood, Sacramento, No. 453,355. Dated Nov. 17, 1891. The object of this wagon-jack is to raise the whole vehicle from the ground, and it is especially useful in lively stables and blacksmith or paint shops where work is to be done upon the vehicle and it is desirable to raise it entirely from the ground. It consists of a base with a parallel frame and connecting bars or links, and a peculiarly constructed lever mechanism, whereby the upper movable part of the frame, when placed beneath the vehicle axle, may be moved about its supporting bars or links so as to raise it and the vehicle. A loaded vehicle may be raised by this apparatus.

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Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assay; Examples of Dressing; The Melting in Crucibles; Scorching; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; Cupellation; Assay by Amalgamation; Finding the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

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Table of Contents.

The following brief abstract of the contents will give an idea of the branches of the subject treated: General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulas Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulae and Rules; Flow of Water through Openings; Weir Coefficients; Triangular Weirs; Flow of Water over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water through Short Tubes and Compound Tubes; Flow of Water through Pipes; Tables of Velocities and Cubic Feet Flows for Given Fall per Mile and Diameter of Pipe; Coefficient for Bend-Circular and Angular; Flow through Nozzles; Inverted Siphons; Flow of Water in Open Channels; Extensive Tables; Rough and Ready Rules; Hints for Speedy and Approximate Estimates, etc.

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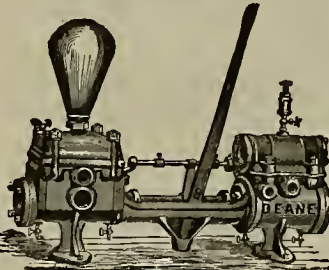
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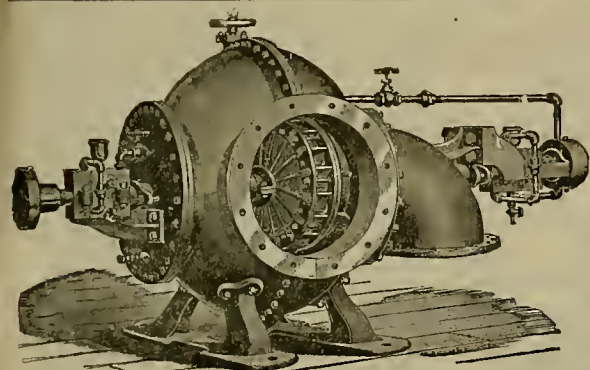
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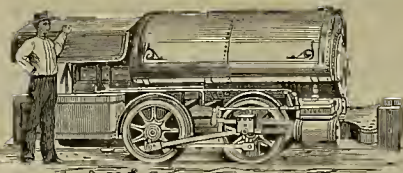
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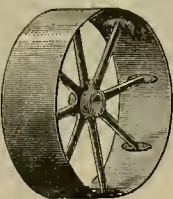
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 25, 1891.

General trade for this time of the year continues fairly active. Railroad construction and other improvements are being vigorously pushed in all parts of the State, calling for large sums of money, which are disbursed as soon as received. The trade of the State are on a more substantial footing than for years past. The local money markets are active but fairly easy. Tax-paying ends for this year with this month, while the annual disbursements for interest, dividends, etc., in January next, are virtually provided for. Eastern mail advices point, with unerring certainty, to an extraordinary prosperous season. *Iron Age*, in its review, says that the State canals are announced to close Nov. 30, the eastward shipments from lake ports will soon close and throw a large traffic on the railroads, which in the West are already blockaded with traffic before the corn season is fairly opened. Railroad receipts for October show the heaviest gain since October, 1889, and this although the ore traffic was smaller than a year ago.

The preliminary Government statement of the exports for October makes it probable that the aggregate may exceed \$100,000,000 for the first time in the history of the country, and this despite a decrease in the value of cotton, provisions and oil, the gain being due to breadstuffs alone. Shipments were unusual both from New Orleans and the Pacific Coast.

MEXICAN DOLLARS.—The market continues dull at around 74 cts.

QUICKSILVER.—Receipts the past week aggregate 303 flasks. The demand continues fair, with quotations reported unchanged at pool rates given out about a fortnight ago.

SILVER.—The market has shown only slight fluctuations in quotations either at home or abroad. The situation, so far as we are able to learn, is virtually unchanged. It looks very much as if there will soon be a pronounced movement in the United States and in Europe to advance the market price, but this is hardly likely to set in until after Congress meets. The developments in the suit against the directors of Hale & Norcross Mining Co., are calculated to show the erroneous conclusions of many "gold bugs" that with silver remonetized the output of the Comstock mines will be largely increased, for according to the testimony adduced, it seems safe to say that over one-half of the bullion turned out was not made public and therefore there can not be any material increase in the output of the metal.

LIME.—Receipts the past week aggregate 3690. The exports to the Hawaiian Islands appear to be increasing. The demand in this State is quite free.

BORAX.—On Nov. 20 there was shipped by water to New York 1016 cts. The market is fairly steady at current quotations. On Nov. 24 the steamship Mineola for New York took out 3018 sks of borax and 1350 sks borates.

CHROME ORE.—Shipments to New York continue to be made at regular intervals. On Nov. 20 there was forwarded by sail vessels 1398 cts.

TIN.—The local market continues dull and lifeless. In plate, outward freights from England are advancing, which will have its influence on values for shipment. At New York concessions are being made on both pig and plate, but without leading to much business. London cables to *Iron Age* report the plate market quiet with no immediate improvement looked for.

LEAD.—The local market is reported slightly firmer at unchanged quotations. At the East the market is reported stronger under firm holding and a fair inquiry.

ANTIMONY.—The market is strong with an advance obtainable in sympathy with better prices at the East and in Europe.

IRON.—Imports the past week aggregate 528 tons from Liverpool. The spot market is firm. For shipment, higher outward freights cause higher asking prices.

COKE.—Imports the past week aggregate 1677 tons. The spot market is soft, but for shipment it is firm.

COPPER.—The market is essentially unchanged. The loss by fire of the Union mills at Copperopolis will curtail the output on this coast. New York mail advices report as follows: Consumers have purchased a number of small lots of Lake Superior ingot, for delivery during the balance of the year at 17 1/2 @ 17 3/4. The transactions reported involve a total of 500,000 to 600,000 pounds. No inclination to anticipate future wants is manifested, and the leading producers pretend to be indifferent, claiming that a large portion of the present and near future output is under the control of orders. The fact remains, however, that more than enough copper to go around comes out from some source or other, and the competition of the smaller companies and speculative holders is met even by the apparently strongest concerns when it comes to matters of actual business.

COAL.—Imports the past week aggregate as follows: Newcastle, N. S. W., 15,446 tons; Departure Bay, 7232; Liverpool, 3594; Glasgow, 1800; Swansea, 3510; Cardiff, 2490; Coos Bay, 1300; Seattle, 2653. Total, 38,025 tons. The spot market is more or less demoralized, owing to heavy arrivals and no yard room. Large dealers claim that the market will soon begin to steady itself, but we admit that the present outlook does not warrant any improvement for some time to come. For shipment higher prices are asked for Australian and English.

Eastern Metal Markets.

By Telegraph.

NEW YORK, November 25.—The following are the closing prices the past week:

	Silver	Copper	Lead	Tin
Thursday.....	94 1/2	11 1/2	4 3/4	19 85
Friday.....	94 1/2	11 1/2	4 3/4	20 10
Saturday.....	94 1/2	11 1/2	4 3/4	20 10
Sunday.....	94 1/2	11 1/2	4 3/4	20 10
Monday.....	94 1/2	11 1/2	4 3/4	20 10
Tuesday.....	94 1/2	11 1/2	4 3/4	20 10
Wednesday.....	94 1/2	11 1/2	4 3/4	20 10

Tin is steady under fair business. Copper continues depressed, although the lower prices are attracting buyers. Lead shows continued strength under firm holding. Quicksilver is steady.

Mining Share Market.

Mining shares the past week under review shaded off some, and then hung around the lower quotations. Alta made several erratic moves, acting very much like a fish out of water. With well-informed operators there is a prevailing opinion, said to be founded on personal knowledge, that the Alta pool has, for a long time past, been quietly buying the shares in that group, and to assist the buying, levied assessments at regular intervals, so as to freeze out outside holders. It is claimed that the pool has about all the shares and is preparing for a false deal to peddle out the stocks. This freeze-out game, so successfully worked heretofore, is openly asserted, is being systematically carried out by the Gold Hill pool, so as to get about all of the shares of the leading mines in that end of the lode. In this little game they appear to have met their match in the combination represented by T. Whiteley & Co., stock-brokers. This combination, or outside pool, has been persistent buyers of stock, and may possibly be in position to either control several of the mines or else dictate terms so as to have the mines worked to conform to the laws of this State governing incorporated mining companies. In outside mining shares, there is steady buying of stocks, which gives unmistakable evidences of a bull campaign being near at hand. The buying is being done by a pool formed to control the stocks in each district.

The suit against the Hale & Norcross directors is throwing considerable light upon the way in which shareholders in the Comstock mines have been and are being systematically wronged—not to call it by a deservedly harder name. The suit will undoubtedly show who got the bullion.

A correspondent sends the following peculiar combination of words: It is said that President Levy of Hale and Norcross secures assessment levying of Hale and Norcross, so as to Harmonize affairs, by which to get their Marks on each certificate of shares outstanding.

Among those in position to know, and judging from Attorney Baggett's examination of witnesses in the Hale and Norcross suit, it appears that suit may be brought against several brokers who gave their proxies for voting stock not owned by them. They can and doubtless will be made party to any fraud that has been or that may be perpetrated by those who have been or may be unlawfully voted through their proxy into the directorship of any mine.

Mining shares opened this (Thursday) morning active and higher for North End stocks, but after Call quotations shaded off under inside manipulation. The market has every indication of steadily working into better position for an up move. While it may be slow at first, yet it will come, and much better prices obtain for some of the shares than have been realized at any time in this year. Outside mining shares are undoubtedly coming to the front soon, and much higher prices rule in the near future.

A correspondent suggests that M. W. Fox, in his suit against the Hale and Norcross directors, try and get at the facts about a report current that when insiders own stocks, they do not pay assessments. He claims they give their notes for the amount, and after a short time the notes are cancelled by some kind of imaginary work or in a similar way.

News from the Comstock mines is confirmatory of continued active developing work to the west on several levels in the leading mines of each group. In Con. Virginia they can show up rich ore on two or more levels, and at any time desired. In Ophir the work going on is being closely watched, and good results looked for soon. The same remarks apply to Mexican. The movement to buy up the Sierra Nevada stock may possibly stop, for a short time at least, the showing up of ore in that mine, and instead cause the levying of an assessment or two. Very little news can be had from Best and Belcher and Gould and Curry, but mining men are very hopeful of good results from the work underway in the two mines. In Savage they appear to be opening up a genuine bonanza, and are levying assessments to frighten outsiders from buying. In Hale and Norcross the outlook is of the most promising character, but the pool wants the stock, and is doing everything possible to get it. Chollar will probably show up by next spring the rich ore found to the west. Potosi and Bullion ought to come to the front soon, provided the stock is concentrated, and show up the ore found some time ago and which they have been getting into better working position. The important work now underway in several of the Gold Hill mines will be supplemented soon by still more important work, which ought to cause the shares to sell at much higher prices. In Overman, they can and doubtless will uncover considerable good to high grade ore. In the Alta group, bull reports are afloat.

From the outside mines our advices report that the Silver King mill and the Peer and Peerless mill will start up in next month. The Holmes mine is reported to be turning out more bullion. In the Tuscaroras ore is being shipped for reduction, and large bullion returns will soon be in order. In the Bodie they continue to take out ore from Bodie, Bulwer and Standard. It is reported that in Bulwer another strike has been made, but the assessment keeps the stock down, probably for inside buying.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

INTERNATIONAL ELECTRIC SUPPLY AND CONSTRUCTION Co., Nov. 23. Capital stock, \$5,000,000. Directors, Columbus Waterhouse, James Spiers, H. S. Crocker, C. O. Swanberg, C. S. Benedict, A. F. Johns, E. E. Parsons, C. Montgomery and Andrew Brown.

UNITED TREE AND STUMP EXTRACTING Co., Nov. 23. Capital stock, \$1,000,000. Directors, Alfred Taylor, E. J. Mahoney, T. W. Shaw, R. A. Donald and E. J. Mahoney, Jr.

WESTWARD VINEYARD AND ORCHARD Co., Nov. 23. Capital stock, \$500,000. Directors, S. J. Hendy, C. V. Manner, W. E. Lutz, J. H. Hendy and C. W. Tozer.

ACME FILTER Co., Nov. 23. Capital stock, \$100,000. Directors, M. Kraker, M. Israel, M. S. Eisner, Wm. McDonald, J. P. Currier, N. Delbance and J. Simon.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

COMPANY AND LOCATION.		No. AMT. LEVIED, DELINQ'T AND SALE.		SECRETARY.	
Alta M Co, Nevada.....	40.....	30c.....	Oct 8, Nov 11, Dec 2.....	L Oshorn, 303 Montgomery	
Alpha Cal M Co, Nevada.....	50.....	25c.....	Nov 4, Dec 8, 10, 12, 13.....	O E Elliott, 303 Montgomery	
Best & Belcher M Co, Nevada.....	50.....	25c.....	Nov 6, Dec 11, Dec 31.....	L Oshorn, 303 Montgomery	
Bodie Cons M Co, California.....	13.....	25c.....	Sept 23, Nov 5, Dec 9.....	H D Walker, 303 Montgomery	
Bulwer Cons M Co, California.....	7.....	15c.....	Oct 28, Dec 31, Dec 31.....	L Oshorn, 303 Montgomery	
California & Arizona M Co, Arizona.....	4.....	10c.....	Sept 24, Nov 9, Dec 20.....	T E Jewell, 310 Pine	
California Verde Marble Co, California.....	1.....	1c.....	Nov 28, Dec 28.....	W J Scott, 303 Pine	
Chollar M Co, Nevada.....	31.....	50c.....	Oct 26, Nov 30, Dec 30.....	C E Elliott, 303 Montgomery	
Confidence Silver M Co, Nevada.....	19.....	75c.....	Nov 17, Dec 22, Jan 11.....	A S Groat, 414 California	
Cons Imperial M Co, Nevada.....	32.....	5c.....	Nov 2, Dec 8, Dec 23.....	O L McCoy, 331 Pine	
De Monte M Co, Nevada.....	5.....	10c.....	Sept 28, Nov 3, Nov 30.....	J W Pew, 310 Pine	
Eureka Cons Drift M Co, California.....	4.....	2c.....	Oct 25, Nov 20, Dec 21.....	D M Kent, 330 Pine	
East Best & Belcher Silver M Co, Nevada.....	7.....	20c.....	Oct 22, Nov 24, Dec 12.....	C H Mason, 331 Montgomery	
Fall River Cons Gold Quartz M Co, California.....	6.....	2c.....	Oct 20, Nov 25, Dec 21.....	L Casell, 115 Front	
Gray Eagle M Co, California.....	23.....	4c.....	Oct 27, Nov 3, Dec 21.....	W Barrows, 303 California	
Hale & Norcross M Co, Nevada.....	32.....	50c.....	Oct 16, Nov 24, Dec 15.....	A B Thompson, 303 Montgomery	
Head Center and Tranquility M Co, Arizona.....	3.....	5c.....	Nov 12, Dec 13, Jan 11.....	J W Pew, 310 Pine	
Horse Shoe Bar Cons M Co, California.....	3.....	8c.....	Oct 30, Dec 1, Dec 22.....	D M Kent, 330 Pine	
Kentucky Cons M Co, Nevada.....	2.....	15c.....	Oct 26, Dec 1, Dec 23.....	J W Pew, 310 Pine	
Kiogman M Co, Arizona.....	1.....	5c.....	Oct 12, Dec 1, Dec 23.....	T E Jewell, 310 Pine	
Monterey M Co, California.....	31.....	25c.....	Sept 17, Oct 27, Nov 3.....	H D Walker, 303 Montgomery	
Monterey M Co, California.....	3.....	5c.....	Oct 2, Nov 6, Dec 2.....	J W Pew, 310 Pine	
Occidental Cons M Co, Nevada.....	8.....	25c.....	Oct 19, Nov 23, Dec 16.....	A K Durbin, 303 Montgomery	
Peer M Co, Arizona.....	1.....	5c.....	Nov 5, Dec 8, Dec 28.....	N T Messer, 303 Montgomery	
Peer & Norcross M Co, California.....	10c.....	5c.....	Nov 5, Dec 8, Dec 28.....	E B Holmes, 303 Montgomery	
Savage M Co, Nevada.....	9.....	25c.....	Oct 29, Dec 1, Dec 21.....	E B Holmes, 303 Montgomery	
Sig Belcher & Mides Cons M Co, Nevada.....	100.....	60c.....	Oct 6, Nov 11, Dec 1.....	E Sarker, 303 Montgomery	
Silverado M Co, California.....	2.....	2c.....	Oct 12, Nov 15, Dec 17.....	S G Cox, Chronicle Building	
Silver Hill M Co, Nevada.....	29.....	10c.....	Nov 12, Dec 15, Jan 5.....	D C Baker, 303 Montgomery	
Siskiyou Cons Quicksilver M Co, California.....	1.....	4c.....	Oct 9, Nov 12, Dec 4.....	E F Stone, 303 Pine	
Utah Cons M Co, Nevada.....	13.....	25c.....	Oct 16, Nov 24, Dec 18.....	A H Fish, 303 Montgomery	

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
Mexican M Co, Nevada.....	Annual.....	O E Elliott, 303 Montgomery	Dec 1
Riverside M & M Co.....	Annual.....	J Stadfeld, Jr., 303 Montgomery	Nov 30

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Obamption M Co.....	10.....	T Wetzel, 320 Sausage.....	Aug 15
Ona Cal M Co, Nevada.....	50.....	A W Moolgobler, 303 Montgomery	Aug 15
Copita M Co.....	30.....	E M Hall, 311 Montgomery	Sept 10
Eureka Cons M Co, Nevada.....	25.....	101 Sausage St.....	Dec 3
Great Western Quicksilver M Co.....	25.....	A Halsey, 328 Montgomery	Oct 1
Idaho M Co, Grass Valley.....	3.....	Grass Valley.....	Aug 4
Marion Cons M Co, California.....	50.....	M Kent, 330 Pine.....	Aug 10
Pacific Coast Borax Co, California.....	1 00.....	A H Clough, 230 Montgomery	Nov 10
Standard Cons M Co, California.....	10.....	J W Pew, 310 Pine.....	Oct 26

HOME BUILDING Co., Nov. 23. Capital stock, \$50,000. Directors, F. Shay, W. A. Harvey, D. W. Ross, O. W. Forsyth and H. B. Sultan.

U. S. WATCH CO., Nov. 24. Capital stock, \$50,000. Directors, C. H. Morrell, E. F. Colling, G. C. Weir, J. H. Waterman and H. B. Montgomery.

ELECTRIC ORE-REDUCING Co., Nov. 24. Capital stock, \$2,000,000. Directors, Monroe Thompson, W. L. and F. E. Brown, J. Gordon and S. B. Clark.

EL ENCINO M. Co. (Oakland) Nov. 21. Capital stock, \$90,000. Directors, M. Chapman, Wm. McDonald, E. S. Culver and W. S. O'Brien.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb.....	@ 15	English, lb.....	@ 20
BORAX.....	@ 15	Canton tool.....	@ 20
Refined, in car lots 8 @	15	8 1/2 Diam tool.....	@ 9
powdered, do 7 @	15	8 1/2 Machinist.....	@ 9
Concentrated, do 7 @	15	8 1/2 Culk.....	@ 4
All grades jobbing at advan.			
COPPER.		TIN PLATE.	
Bolt.....	22 @	B. V. steel grade.....	6 25 @
Sheet.....	22 @	1 1/2 spot.....	6 25 @
Ingots.....	22 @	1 1/2 spot.....	6 25 @
Do, wholesale.....	22 @	Do roofing, 14x20 6 00 @	
Fire Box Sheets.....	22 @	Do, 20x28.....	12 00 @
IRON.		COAL.	
Bar, hags.....	3 @	Pig iron, spot.....	@ 21
Norway, hags.....	4 @	Irreg bar, spot.....	@ 21
PIO IRON.		SPT FROM YARD—PER TON.	
Spot Load.....		Wellington.....	\$7 50
Eglington.....	25 @	Gretta.....	8 00
Glenora.....	25 @	Carton.....	8 00
Am. Sott, No. 1.....	25 @	Nanaimo.....	7 50
Oregon Pig.....	30 @	Gilman.....	7 00
Puget Sound.....	30 @	Seattle.....	7 00
Olay Lane White.....	24 @	Costa Rica.....	7 00
Shotts, No. 1.....	26 @	Channel.....	9 50
Langdon.....	25 @	Egg hard.....	14 00
Throcliffe.....	25 @	Oumberland, in sacks.....	11 00
Gartsherrrie.....	25 @	Do, bulk.....	10 00
Barrow.....	25 @	Ball end.....	9 00
Cargill.....	23 @	Scott Split.....	8 00
HROME IRON ORE.		Brymbo.....	
Per ton.....	10 @	West Hartley.....	8 00
LEAD.		TO LOAN—PER BOX.	
Pig.....	42 @	Australian.....	\$7 50 @
Bar.....	52 @	Liverpool Steam.....	7 50 @
Sheet.....	72 @	Scotch Split.....	7 50 @
Pipe.....	62 @	Oardif.....	7 25 @
(Discount 10% on 500 hags.)		Cumberland.....	
Drop, 3/4 hags.....	1 90 @	Egg hard.....	12 00 @ 13 00
Buck, 3/4 hags.....	2 10 @	West Hartley.....	8 50 @ 9 00
Chilled, do.....	2 30 @	OKE.	
By the sack.....	47 50 @	English, to load.....	\$3 00 @ 11 00
Flasks, old.....	40 @ 50	Do, spot, in bulk.....	12 00 @
		Do, in sacks.....	14 00 @

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Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 5.	WEEK ENDING Nov. 12.	WEEK ENDING Nov. 19.	WEEK ENDING Nov. 26.
Alpha.....	35	45	45	45
Alta.....	25	30	35	40
Andes.....	70	80	90	110
Belcher.....	1.15	1.30	1.60	1.50
Belle Isle.....	50	55	60	65
Best & Belcher.....	2.20	2.70	3.85	2.85
Bullion.....	30	1.13	1.05	1.50
Bodie Oco.....	45	50	70	85
Conf. Monte.....	10	15	20	25
Commonwealth.....	15	15	15	20
Oon. Va. & Osl.....	4.35	5.12	5.60	5.50
Challenger.....	85	95	115	145
Chollar.....	80	90	100	135
Conf. Monte.....	2.00	2.60	3.00	3.60
Oon. Imperial.....	10	10	10	10
Consolidated.....	30	35	40	45
Crown Point.....	95	115	145	160
Crocker.....	10	10	10	10
Consolidated.....	25	30	30	30
Eureka Oon.....	30	35	40	45
Exchequer.....	40	45	55	65
Grand Prize.....	1.30	1.45	1.55	1.65
Gould & Curry.....	1.30	1.45	1.55	1.65
Gale & Morcross.....	10	10	15	15
Julia.....	10	15	15	15
Justice.....	35	40	50	60
Kentuck.....	10	15	15	20
Lucky Wash.....	10	15	20	20
Moody.....	30	35	45	45
Mexican.....	1.95	2.15	2.45	2.60
Navajo.....	35	45	55	65
North Belle Isle.....	35	45	55	65
North Queen.....	30	40	45	50
Occidental.....	35	40	45	50
Opbdr.....	2.35	3.11	3.95	3.73
Overman.....	1.15	1.21	1.41	1.71
Potosi.....	1.45	1.55	1.45	2.00
Peerless.....	10	10	15	15
Phoenix.....	10	10	15	15
Savage.....	1.45	1.80	2.30	1.51
S. B. & M.....	35	50	60	70
Sierra Nevada.....	1.45	1.70	2.35	2.70
Sierra Hill.....	10	10	25	25
Scorpion.....	15	20	25	25
Union Oon.....	1.85	2.10	2.85	2.35
Utah.....	35	40	45	50
Yellow Jacket.....	1.25	1.43	1.30	1.95

Assessment Notices.

GRANDVILLE VINEYARD COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Hanford, Tulare County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of November, 1891, an assessment, No. 4, of \$1.00 per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 11th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors,
CHAS. MERSFELDER, Secretary.
Office, 111 Front Street, San Francisco, California.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1891, an assessment, No. 1, of One (1) Cent per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 308 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of November, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the twenty-eighth (28) day of December, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors,
W. J. GURNETT, Secretary.
Office, 308 Pine Street, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 27th day of October, 1891, an assessment, No. 2, of Four (4) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of November, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 21st day of December, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors,
A. W. BARROWS, Secretary.
Office, Room 11, No. 303 California Street, San Francisco, California.

CALIFORNIA CREAMERY COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Novato, Marin County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 2d day of November, 1891, an assessment, No. 1, of Forty Dollars (\$40) per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 11th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors,
CHAS. MERSFELDER, Secretary.
Office, 111 Front Street, San Francisco, California.

DELINQUENT SALE NOTICE.

NEW EL DORADO GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Greenwood, El Dorado County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 2d day of October, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Share.	Amt.
J. L. Wilbert.....	94	5	\$ 25
J. L. Wilbert.....	99	5	25
J. L. Wilbert.....	100	5	25
J. L. Wilbert.....	101	25	1 25
J. L. Wilbert.....	102	25	1 25
J. L. Wilbert.....	106	15	75
W. N. Martin.....	118	100	5 00
W. N. Martin.....	119	100	5 00
W. N. Martin.....	126	800	40 00
W. N. Martin, Trustee.....	154	1,000	50 00

And in accordance with law, and an order from the Board of Directors, made on the 2d day of October, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California, on FRIDAY, the 27th day of November, 1891, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

By order of the Board of Directors,
J. W. PEW, Secretary.
Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

POSTPONEMENT.

Notice is hereby given that the sale of the above delinquent stock has been postponed to WEDNESDAY, December 24, 1891, at the same hour and place.

By order of the Board of Directors,
J. W. PEW, Secretary.
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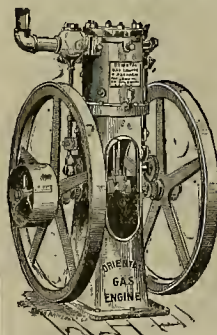
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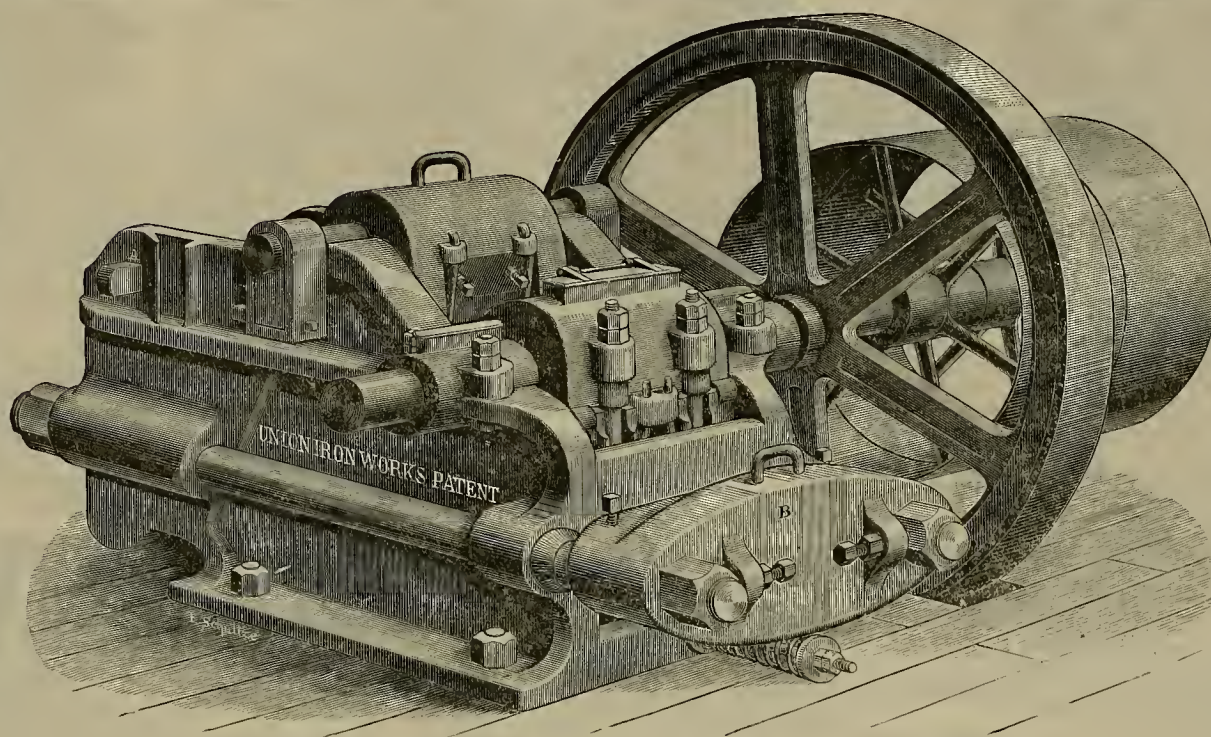
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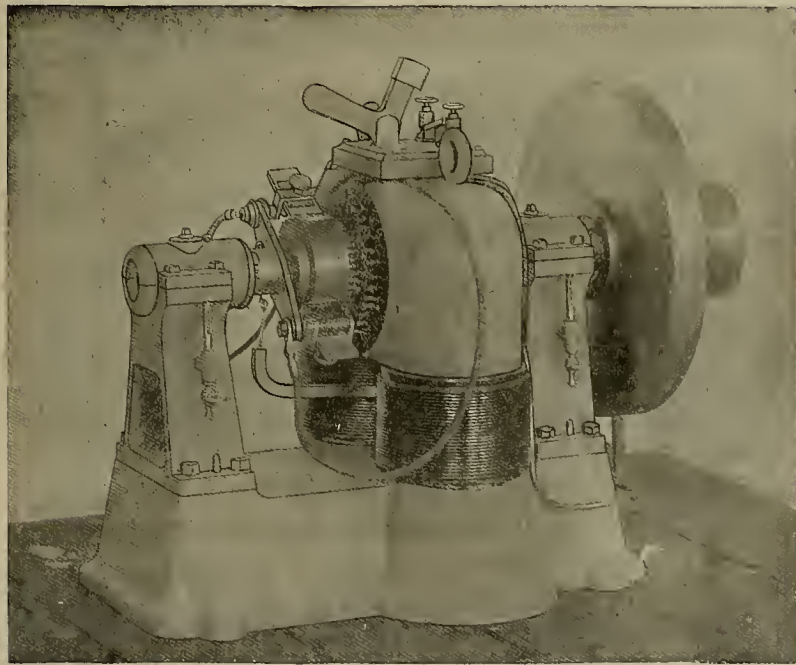
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The Dynamos and Motors manufactured by this Company develop the highest mechanical efficiency; they require little or no attention, are almost noiseless, and run with an entire absence of sparks at the brushes, rendering the daily trimming of brushes unnecessary.

Electric Power Apparatus for Quartz Mills, Hoisting, Pumping, Drilling, and all Mining Work, where Long Distance Transmission is desired, a Specialty.

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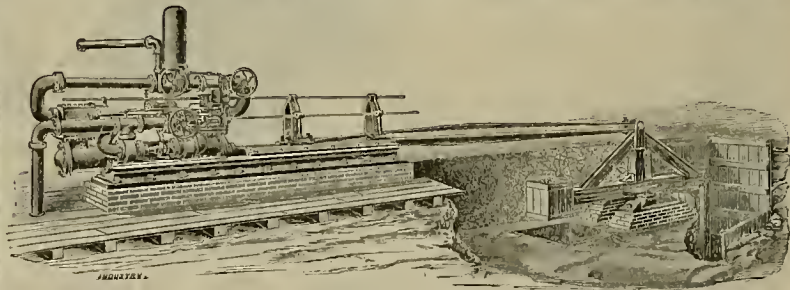
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DYNAMOS, CIRCULAR SAWS, BLOWERS AND QUARTZ MILLS.

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RAND DRILL COMPANY,

ROCK DRILLING, AIR COMPRESSING,
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Office and Works, 21 & 23 SPEAR ST., San Francisco, Cal., U. S. A. DEWEY & CO. { 220 MARKET ST., S. F. } PATENT AGENTS. Elevator, 12 Front

FRUE ORE CONCENTRATOR

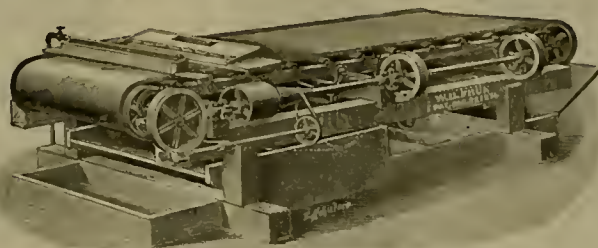
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880

September 18, 1883; July 24, 1888;

and March 31, 1891.

Price of Plain Belt Frue Vanner, \$575, l. o. b.

Price of Improved Belt Frue Vanner, \$825, l. o. b.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

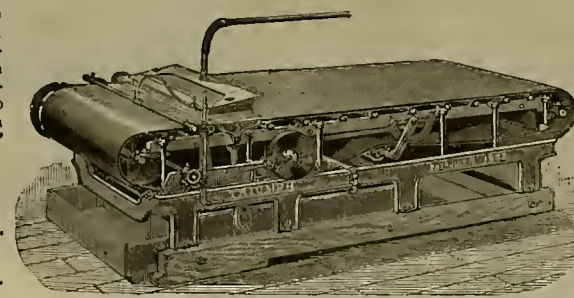
"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrator, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frue" have improved (corrugated) belts does not militate against the superiority of the "Triumph"; for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt . . . \$650 f. o. b.

Price "Triumph" Concentrators, with Plain Belt . . . \$550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,

39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.
GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

Signed] Sup't North Star and Original Empire Mining Co.
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

LONG DISTANCE

ELECTRIC POWER TRANSMISSION.

WATER POWER

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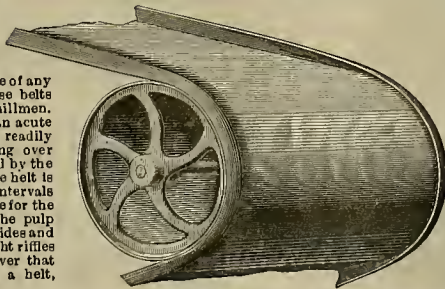
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Agent for HOSKINS'

HYDRO-CARBON ASSAY FURNACES.

THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

IT HAS NO EQUAL

Can Be Put On
by Any One,



POSITIVELY FIRE-PROOF.

Adopted by the
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MAGNESIA SECTIONAL COVERING

For BOILERS, STEAM PIPES, COLD STORAGE, and all places requiring Non-Heat-Conducting Material.

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DEWEY & CO. { 220 MARKET ST., S. F. } PATENT AGENTS.
Elevator, 12 Front.

PARKE & LACY COMPANY,

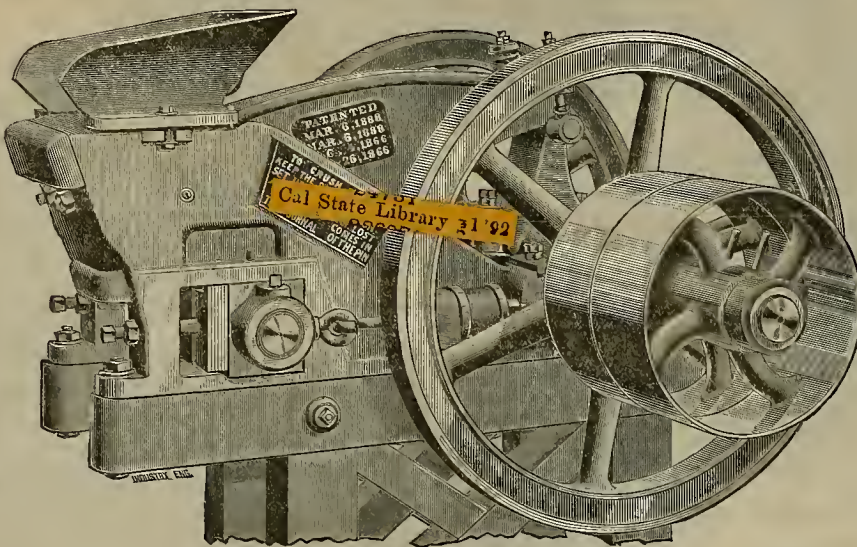
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DODGE IMPROVED ROCK BREAKER.

INGERSOLL - SERGEANT
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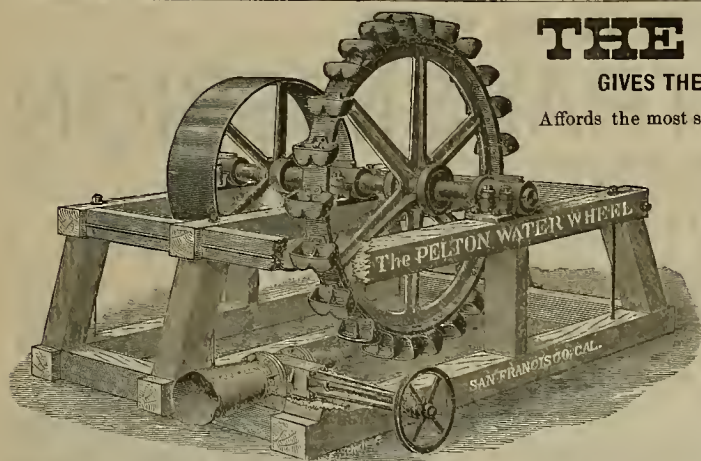
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GENERAL AGENT FOR WESTINGHOUSE AUTOMATIC ENGINES.

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GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 2000 IN ACTUAL USE.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other wheel in the country.

ELECTRIC TRANSMISSION.

The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

All applications should state amount and head of water, power required and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

THE PELTON WATER WHEEL CO.

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143 LIBERTY STREET, NEW YORK, U. S. A.

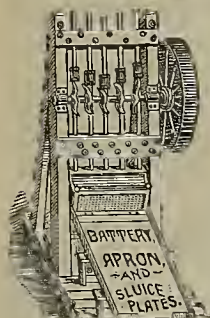
PELTON WATER MOTORS, Varying from the fraction of 1 up to 40 and 50-horse power, unequalled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. SEND FOR MOTOR CIRCULAR. Address as above.

THE GATES ORE AND ROCK BREAKER.

UNLIMITED IN CAPACITY. UNEQUALLED IN EFFICIENCY. UPWARD OF 8,000 NOW IN USE. Will do more than twice the work of any other with the same cost in wear. Gives a fineness of product that increases the capacity of any mill from 25 to 40 per cent without any additional expense. THE BEST AND ONLY CRUSHER ADAPTED TO MACADAM ROAD WORK. Send for Circular.

It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

THE PELTON WATER WHEEL CO., 121-123 Main Street San Francisco, General Western Agents.



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PRICES GREATLY REDUCED. ONLY REFINED SILVER AND BEST COPPER USED. OVER 3000 ORDERS FILLED. FIFTEEN MEDALS AWARDED. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated. These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Streets, San Francisco.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,

E. G. DENNISTON, Proprietor.

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Our Plates have been used for 20 years. They have proved the best. We adhere strictly to contract in weight of Silver and Copper. SEND FOR CIRCULAR.



RECEIVED EVERY MEDAL Awarded on the Pacific Coast for Silver-Plated Amalgam Plates and Best Gold, Silver and Nickel Plating.

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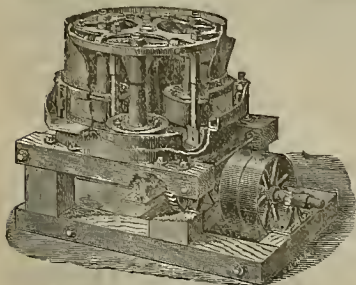
CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description.

Steam Engines and Shingle Machines.

SEND FOR CIRCULAR.



Centrifugal Roller Quartz Mill.

213 FIRST STREET.

SAN FRANCISCO, CAL.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 23.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 5, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

An Electric Mine Pump.

The triplex electric pump is designed to produce a discharge of constant velocity, thus reducing the power consumed in overcoming the inertia of the water column, eliminating water hammer, and giving a smooth, noiseless and continuous action. The Gould Manufacturing Co. of Seneca Falls, N. Y., makes a special type of the triplex electric pump, with extension bed-plate to receive motor, and designed to meet the requirements of mine pumping. This is shown in the accompanying cuts. Unlike the standard pump, this is built with phosphor bronze hushed cylinders, glands and solid plungers of same metal to resist action of sulphuric acid, usually encountered in mine pumping. The connecting rods are tied to the crank shaft by solid bronze hushed strap ends having adjustment for wear. The bronze suction and discharge valves on either side of cylinder are of a simple yet heavy substantial pattern, best adapted for severe and continuous service. The construction of the pump will admit its being taken apart as may be necessary to carry into mine, and as readily put together for service. It will work against any pressure up to 500 feet lift.

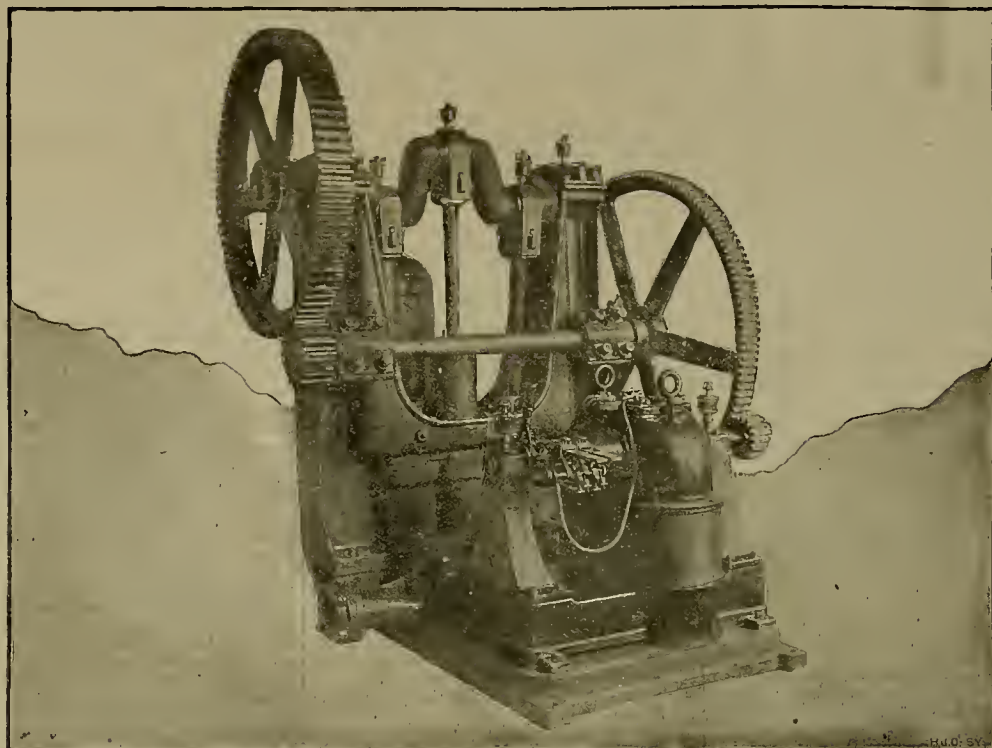
As is well known, mine pumping has been generally performed with steam pumps. With the electrical transmission, pumping can be done at places where heretofore it has been impossible to operate the steam pump from the long distances which the steam must necessarily be conveyed, and because of the small space required by the electric pump in comparison.

One of the cuts shows one of these pumps placed at the sump in the main shaft. The float is placed on the reservoir which automatically controls the operation of the pump. When water falls below the predetermined point the

pump is stopped; when it rises again, the pump is started.

SEVERAL well-known mining men of this city, among them Daniel M. Burns, Geo. R. Walls,

GOULD'S TRIPLEX ELECTRIC MINE PUMP.



C. Waterhouse and M. R. Higgins, left this city Thursday to inspect the Candelaria and San Vicente mines, Mexico. The main purpose of the trip is to close up a mining deal, in

which J. W. Mackay, James L. Flood, Colonel Burns and a London syndicate are interested. Several months ago the syndicate bought the San Vicente property, in the Sinaloa district, and the present expedition's trip is almost sure to result in the purchase of the mine outright for a figure something in excess of \$2,000,000.

Silver in Europe.

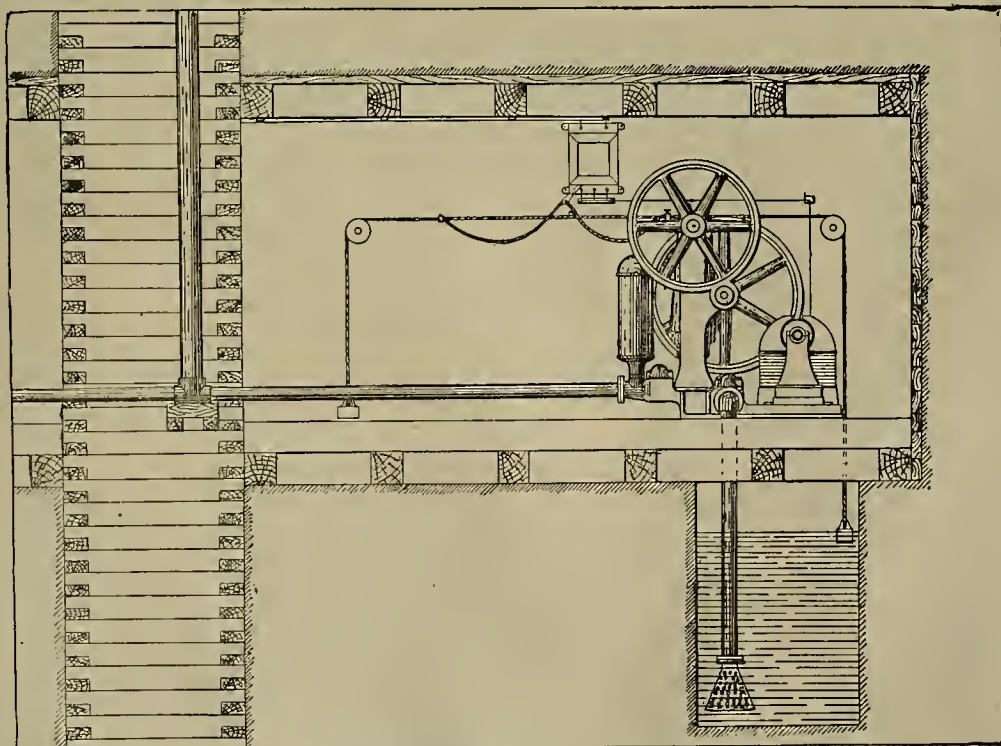
News from Europe begins to indicate that there is a strong tide setting in favor of bimetalism in both England and Germany. With a change in sentiment it now looks as Mr. Seligman's mission to European Governments to promote an international agreement or conference favorable to bimetalism is likely to prove a success.

In Great Britain the great textile industry is taking up the silver question, and in every desirable way possible is appealing to the Government to enhance the price of silver by adopting bimetalism. The leading agricultural interests of that country in the forefront of this year made a similar appeal to the Government.

Russia, if we can credit telegraphic advices, is considering plans to introduce silver more generally, and in carrying out that project may convert a large part of its gold holdings into silver. By doing this, that country will be a very large gainer financially. The French, it is well known, are floating Russia's latest loan project, and as France is bimetallic it is only reasonable that Russia will be induced to take a more favorable stand toward silver than she has heretofore held.

The State Immigration Association is practically dead, from lack of interest.

Of the 450 students at Stanford University, 302 are native Californians.



ELECTRIC MINE PUMP IN OPERATION.

Rural Free Delivery.

We recently mentioned the fact that Postmaster-General Wanamaker was receiving much evidence to prove that his scheme for free house-to-house delivery of mail in country districts is quite feasible. It is a most excellent idea, and we wonder it was not sooner urged. We have come to agree that city residents should have all the improvements and conveniences, and that the country should wait upon itself. This too common belief may be found to be wrong in many respects, and it certainly is proven to be wrong in the matter of free delivery of the mails. The *American Agriculturist* has succeeded in obtaining from the Postmaster-General a short article on the subject, "Postal Delivery for Country Districts," and the theme is of such pressing importance and of such deep significance that we shall quote largely and bring the matter as prominently to attention of our readers as possible, to the end that all may take occasion to urge it upon the attention of the Congressmen representing their districts at Washington. One argument Mr. Wanamaker makes in favor of the rural residents is this:

"True enough, the village or cross-roads inhabitant, or the dweller on the farm, chooses his home for his family and might live in the city, where gas and water, and mails are brought to his door; but when people everywhere pay the same rate of postage, why should one portion of them have mail facilities denied to other portions? Is it fair to the rural localities to refuse postal service equal to that provided for the cities? Is it not a reflection on the intelligence and aspirations of the farmer and the artisan to ignore his need of the conveniences of correspondence and of supplies of newspapers and magazines? Does it not retard the settlement of country districts, to neglect to provide, in some form or other, means for at least daily intercourse with the rest of the world?"

"To carry letters, newspapers, and magazines, and leave them in an office remote from the home to be called for, is only a partial fulfillment of the duty of the Department. With the well-paid railroads, star-route contractors, and mail messengers, traversing every highway to the uttermost rock and corner of the land, there ought to be some practical way to utilize all these forces and spread the house to house delivery over almost every square mile of this great country. I firmly believe that when such a scheme is in proper operation for a year, it will be proven that the increase of revenue will fully counterbalance the necessary expenditure."

We believe this sound throughout both in its plea for justice to rural residents and in its claim that such justice will pay the department as a business proposition; and we will go further and claim that such free delivery throughout the rural districts will be of vast advantage to city residents, and second only to free delivery of their own mail matter. Trade of every kind would be fostered and quickened by daily delivery throughout the country. Orders for city goods would be multiplied, and city orders for country produce would also multiply. If a merchant or a private consumer could count upon his written order being delivered at once in the country, commercial correspondence with the interior would increase vastly in amount and importance. So, too, with advice as to markets. Great as would be the benefit of such prompt information to the producer, there would be advantage as well to the merchant. Beyond this there are social and other benefits from lifting rural communication above the occasional visit to the country postoffice, the value of which it would be difficult to estimate.

As we have stated in earlier issues, there is now in progress a limited trial of the country delivery system, and of this Mr. Wanamaker says:

"The last Congress listened to arguments on this subject, and allowed the Postmaster General to use \$10,000 of the appropriation for free delivery for an experiment in the small towns, villages and farming districts. This fact becoming known to some extent through the newspapers, applications were made for a trial of the plan; and in the order received, 47 offices in 31 States were equipped with letter-boxes and carrier service. The first 12 of these offices were designated Feb. 1, 1891, and a five months' trial is all that has been allowed up to the close of the Department fiscal year. It is, therefore, too soon to get full results."

"But it is clear from the figures at hand that the increase of revenue more than paid all the increased expense. This is a significant fact, and if the same results follow further experiments, a great extension of the free delivery is readily at hand."

This being the case it is clear that the realization of house to house delivery in country districts depends in large degree upon the persistency with which country residents demand such service from the Post-Office Department. The way to demand it is to work upon Senators and Representatives in Congress by personal interview, by correspondence, by petition and resolution and the like. Urge upon them the need of fuller inquiry into the feasibility of extending mail delivery to rural districts. Mr. Wanamaker says: "A long forward stride would be made in the postal service if the next Congress could find time to consider what are commonly regarded as the little things of Post-

Office Department, but which are really the necessary and all-important touch of the largest department of the Government upon the comfort and progress of all the families of the country, as well as of every business enterprise, great and small."

It is well to continue, of course, the great reforms needed in the postal service, postal telegraph, postal banks, etc., and even these would be more feasible, if the daily postal service were first brought nearer to the homes of the people by regular distribution of the mail, which now often lies days and even weeks in the offices because people are too busy to spend the time to go after it. We hope this subject will commend itself to the active interest of our readers.

Bituminous Rock.

Competition in the bituminous rock business says the Santa Cruz *Surf*, has been carried to the point where competition ceases and combination begins. As a consequence, all the owners of bituminous rock quarries in this county and San Luis Obispo have united in the formation of a company upon a plan similar to that of the Central Milling Company, and each individual owner has leased his quarry to the new company by which mining operations will be carried on, and the market supplied from whatever source it can be the most easily obtained.

The new company is officered by A. Walrath, as President and A. O. Bassett as Secretary, but the general superintendency and management of the business will be in the hands of J. A. Fairchild of San Luis Obispo.

The bituminous rock quarries now developed in San Luis Obispo county are immediately upon the line of the narrow gauge road which runs to Port Harford and connects with the wharf at that point. Rock quarried there, shipped by rail to Port Harford and thence by vessel to Alviso, has been delivered in San Jose at 25 cents per ton less than the rock from the Santa Cruz quarries only 40 miles from San Jose. Of course, there is something radically wrong with the transportation question when such a condition of facts exists.

It was with a view of investigating this and obtaining all information possible upon the situation, that G. M. Perne, J. H. Swift, A. E. Buckman and J. A. Fairchild of the Consolidated Bituminous Rock Company, accompanied by A. H. Walker of the S. P. C. R. R., arrived in town on Saturday evening, and Sunday made a tour of inspection of the quarries in this county and the roads leading thereto, to ascertain how much the cost of hauling might possibly be reduced.

It is a long rough road over which the hauling is now done and the compensation for teamsters is meager enough. The only way the cost of hauling can be reduced is by reducing the distance to the mines, and improving the highway.

After considerable prospecting it was decided that if right of way could be secured, it would be possible to construct a road from the mines across the Wilder ranch which would lessen the distance two miles or more.

If this could be accomplished and the county road improved on the Wilder and Moore hills, it would be possible to increase the hauling capacity of a team sufficient, perhaps, to reduce the price per ton. This, together with an amended and decidedly modified railroad schedule, would secure the entire business for the local mines, as the quality of Santa Cruz rock is superior to the southern deposits.

About 200 tons per day of rock is now being mined and the sums paid for mining and hauling amount to from \$8,000 to \$10,000 per month—not a trifling business.

The prospect for permanence and increase improves each year, as the superior value of this material for paving purposes is recognized abroad. There is work now "in sight" in San Francisco alone, which will consume 80,000 tons of rock, while with reasonable freight rates there would practically be no limit to the area of its consumption.

Although the present company controls all the quarries now opened, yet they can only hold the market by maintaining reasonable prices as fortunately the deposits of this material are extensive and there are many sources of supply as yet undeveloped.

HAND AND MACHINE DRILLING.—To prove that a quartz mine can be run at much less expense at present than it could be done in years past, the *Oroville Register* quotes a gentleman now connected with the Palo Alto mine in Butte county. As an illustration, he said they were running a long tunnel through very hard granite using an Ingersoll drill run by compressed air. The air was furnished by an engine which was run at an expense of \$2.50 a day for two men, and two cords of wood at \$1.25 a cord. The work performed was 50 feet a week in the tunnel. Five men were employed handling the drills at \$2.50 per day for each. This foots up \$17.50 for labor and \$2.50 for wood or \$20 a day or \$140 a week. One day the engine broke down and for seven days hand-drillers were at work. Seven of them were employed at \$2.50 a day, and the tunnel was driven just seven feet in the week or one foot a day at a cost of \$17.50 a foot. By using the power drills it had cost \$2.80 a foot, or it cost a little more than six times as much to do the work by hand-drilling as it did to do it by power.

A Very Rich Gulch.

The Record of Oregon Canyon.

Jauch Urey, who is engaged in writing up "Notes of the Past" for the Georgetown *Gazette*, is putting many good things into print, which otherwise would be lost to history. He was one of the early settlers of the Georgetown divide, and has a fund of reminiscences, which his interesting pen is giving to the world through the medium of the press, in the most attractive manner.

In the *Gazette* of the 19th, he has the following:

Oregon Canyon lies to the north of Georgetown; it heads nearly in the townsite and empties into Canyon creek. It runs in a northerly direction, and is over a mile in length.

From what can be gathered from early settlers, we learn that William Hudson and four others came here from Oregon in the summer of 1849. This party did the first work in Oregon Canyon. They commenced on the falls, where Hudson Gulch empties. They soon ascertained that they had discovered rich diggings, both in the gulch and in the canyon. For the purpose of keeping their discovery a secret, they did not camp near their claim, but pitched their tent some distance above. They were suspected by other parties of having rich diggings, and were watched and followed from their camp to their claim. The Hudson Company took in these watchers or interlopers as partners with them. This was done to keep the diggings a secret, and to keep others out of the canyon. The gulch they called "Hudson Gulch," and they gave the canyon the name of "Oregon Canyon."

In September, 1849, Hudson and his party wrapped their sack of gold in their blankets and put it on a pack animal and left for Oregon. Hudson said he knew of another rich canyon, and intended to come back and work it the next season. He was lost at sea on his return trip in 1850.

There was a fabulously rich place found on the west side near the mouth of the canyon. It was discovered by a company of sailors, who named it "Sailor Slide." Here gold was taken out by the pound. Ex-Senator Cole and his brother worked in this slide in the summer of 1850. From the lower end of Sailor Slide up to the mouth of Devine Gulch, which is about half a mile, it has been estimated by early miners that the canyon would average \$1000 to the lineal foot, or, in other words, \$3000 to every yard in length of the canyon. Upon the basis of this estimate, the half-mile of the canyon yielded the sum of \$2,640,000.

From Sailor Slide down to the mouth of the canyon, the ground was rich and paid well, but it was not as good as the ground above. The same may be said of the canyon above the mouth of Devine Gulch; it paid well, but was not as rich as the ground below. Now, if we assume that these two sections only paid one-fourth as much as the other ground, this would give a total yield of the whole canyon of \$3,300,000.

The gold found in Oregon Canyon was smooth and heavy; some was black, being coated with black cement, which adhered so firmly that it had to be removed with nitric acid. This same kind of "black gold" was also found in Mameluke Hill. In 1850, Alonzo Kinley found a nugget of gold in Oregon Canyon worth \$1250. In September, 1850, a man by the name of Jenkin found a smooth nugget in Hudson Gulch the shape of a goose egg, worth \$1000.

B. C. Carrier says that in 1852 he found a strange-looking piece of whitish metal in Oregon Canyon; he showed it to Prof. Blake, who pronounced it "Hessite," a rare metal, but it has no commercial value. The "black gold," the gravel and the cement howlders in Oregon Canyon are of the same character as found in Mameluke Hill. The canyon runs along the base, and heads in this hill. The water of the canyon, aided by the winter freshets, has been to work for countless ages alighting off this section of the hill, carrying down the canyon the cement howlders, gravel and other matter. After the water out a channel down to the bedrock, erosion went on, and cut a channel in the bedrock lower than the bottom of the hill. We might say that nature has sluiced out the rich channels of this portion of Mameluke and carried the gold down the canyon. It is self-evident that a large portion of the gold of Oregon Canyon originally belonged to Mameluke Hill. Oregon Canyon floats the banner for being the richest canyon in El Dorado county, and Hudson gulch takes the palm for the richest gulch.

ALASKA COAL.—Mr. F. W. Worster and Col. S. Lucas were passengers down from Ungah Island by the schooner *Maacotte*. They report that on the northwest portion of this island—the principal one of the Shumagin group, distant about 900 miles to the west of Sitka—some valuable coal mines are located. During the past four years the owners and parties interested have been doing some good work in the way of prospecting and developing the property, and now feel satisfied that they have a good thing. Besides supplying the local demand measures are on foot, it is understood, to place this coal in a large way on the San Francisco market next year. The coal veins lie one above the other 20 to 30 feet apart, numbering four to six workable veins of 5 and 6 feet from roof to floor. These veins can be traced for a distance of two miles. A tramway has been built connecting the tunnel with a 350-ton coal hunker at tide water. Two wharves and dwelling houses have been

erected and there is considerable rolling stock on the ground. By tunneling and back-stopping the coal is easily and cheaply mined, virtually inexhaustible in extent, and it is claimed that cargo lots can be delivered in San Francisco at \$4 per ton. Analysis made by Prof. Price shows it to be somewhat superior to Seattle coal, but being of a lignitic formation, as are all Pacific Coast coals, it carries a large percentage of moisture.—*Victoria Times*.

The Way to Alamo.

Alamo, the camp of the cottonwoods, says the *Lower Californian*, and the biggest gold-mining camp on the peninsula of Lower California, lies about 45 miles southeast of Ensenada, and can be reached by two routes. One leads from here across the Manadero, up the picturesque Las Animas canyon to La Grulla, and on through Little and Big Burro canyons to the divide; and if a person makes the trip on horseback, he leaves the wagon road at the latter place and goes the rest of the way by trail, passing along the entire length of Mexican Gulch—where heaps of earth and innumerable excavations show how the several thousand men employed themselves during the excitement of March and April, 1889—and after rounding the northern end of Alamo Butte, the camp comes into view. It is situated on a wide plain near the foot of Tomasa hill, on whose eastern slope some of the principal mines are located.

The other route to Alamo, and the one more commonly used, affording a fairly good road for vehicles all the way, leads into San Rafael valley and southeast across Santa Clara valley to the camp. This route is known as the stage road, and is 72 miles long, being ten miles longer than the one via La Grulla and Mexican Gulch. In order to see the famous gulch where so many nuggets were brought to light during the excitement, the representative of this paper went to the camp by the latter route. Except for a lone prospector who now and then is encountered as Mexican Gulch is traversed, it is entirely deserted. The cleared places along the banks of the creek, where atood the brush shacks and tents of the miners, give the place a decidedly desolate appearance. The supply of gold has not yet been exhausted, apparently, for a few prospectors still hold on.

Alamo is an interesting place. It is a clean-looking little town, and has some of the best and some of the toughest people on the coast. It is no more than justice though, to say that the good people are in the majority. The camp is the freest, looniest, most happy-go-lucky community on the Peninsula, but yet its citizens have a way of getting there, for all that. Altogether, Alamo is a good, healthy place, with more and better prospects than it is usually credited with having—and the flow of soul and the feast of good cheer there never ceases.

AN ADVERSE OPINION.—Dr. Franklin R. Carpenter of the D. & D. smelter was interviewed by a Deadwood (D.) *Pioneer* reporter, and asked his opinion about the McArthur-Forrest process, that just at present is occupying so much attention. He appeared to think it would not prove efficacious in the treatment of the siliceous ores of Ruby basin and Bald mountain. He said: "I have made a score of tests with the McArthur-Forrest process on the refractory siliceous ores of the country, and find that it gives an average saving of only about 60 per cent of the gold and silver. The ores were treated raw, but that is the only practicable method, as roasting would involve greater expense than the chlorination process. Experiments made on Homestake tailings were much more successful. A competent chemist also made tests on Ruby basin ores that gave but little better results than mine. Of course unfamiliarity with the process may have caused the failure in our experiments. The deadly poisonous nature of the cyanide solution would, in a great measure, prevent its use, as the least contact with the blood would prove fatal in a few minutes. The seepage from the tailings is deadly to cattle, and there is nothing in it for cow towns."

WASHINGTON COKE.—At the present time and for some years past, the Tacoma Company's property at Wilkinson has produced about 40 tons of coke per day. One vein is eminently a coke vein; it produces 65 per cent of coke, and that of a quality unsurpassed by any in the United States. The weight of the coke is 40 pounds, and it is extra hard, consequently especially suited to cupolas where it is necessary for the coke to support immense weight. Mr. Kelley, the superintendent of this property, was in former years a maker of coke in Pennsylvania, and we have seen many of his ovens on the B. & O. railway. Without doubt he is one of the most experienced coke-makers. S. G. Dawson, B. S., estimates the coal area of Washington to be about 800,000 acres, but as far as discoveries have been made, no anthracite except a vein in the Snoqualmie Pass, that is claimed to be about 18 inches thick, has been discovered, and but few veins of coking coal have come to light, yet prospectors are constantly bringing in fine specimens of coking lignite and bituminous. Skagit and Whatcom counties claim veins of coking coal, and the experiments at Sedro have been sufficiently satisfactory to establish confidence, and the Sedro Coal Co., we are informed, intends putting in a large number of coke ovens the coming season.—*Seattle Mining News*.

Mining Congress Resolutions.

Among the resolutions adopted by the recent Mining Congress at Denver were the following:

Free and Unlimited Coinage.

WHEREAS, The demonetization of silver worked a practical violation of every contract then existing in the United States, entailed uncounted losses, reduced prices more than 30 per cent, and its effect is practically to make debts perpetual, as it takes from the debtor, ability to pay, and it causes contraction in the currency, which reduces values until there is no profit left to the farmer, planter or man of small capital to depend upon, after sale of their products, for returns for their labor.

We believe the certificates of the Government, backed dollar for dollar by gold and silver coin on deposit in the Treasury of the United States, is a safe and sound currency and has been approved by the people.

The gold and silver of the West, pouring in a steady stream upon the East for 40 years, vitalized every form of business there, steadied and upheld the credit of the nation through the great war, and made resumption possible, and what we now demand is as much more to the interests of the East than of the West, as the productions of the East exceed in value the productions of the West.

Resolved, That the first National Mining Congress is unalterably in favor of the principles of bimetallism, as approved by Jefferson and Hamilton, enacted into law by Congress in 1793, and accepted by the country for all public and private business for the first 80 years of the country's history; that we believe gold and silver, not one to the exclusion of the other, are the money metals of the Constitution; that we are opposed to any law which treats silver as a commodity; that we believe that gold and silver should have by law equal rights, uses, and monetary powers, and to that end we demand of the Congress of the United States the enactment of a law by which silver shall be coined free in all the Mints equally with gold, and to have with it full and unrestricted monetary power, and that the coinage be in the ratio of 16 to 1, and when the coinage is represented by Treasury notes, each dollar shall represent 412½ grains of standard silver or 25.8 grains of gold.

Silver Certificate.

WHEREAS, By Section 3693 of the Revised Statutes of the United States the faith of the United States is pledged to the payment of its obligations in gold or its equivalent; and

Whereas, By Section 3694 it is provided that the coin paid for duties on imported goods shall be set apart as a special fund, and shall be applied, first, to the payment in coin of the interest on the bonds and notes of the United States; second, to the purchase or payment of one per centum of the entire debt of the United States, to be made within each fiscal year, which is to be set apart as a sinking fund, and the interest of which shall in like manner be applied to the purchase or payment of the public debt; and the Secretary of the Treasury shall, from time to time direct; third, the residue to be paid into the Treasury; and

Whereas, Millions of dollars of duties on imported goods have been paid into the National Treasury since the year A. D. 1878 in silver coin and silver certificates, not one cent of which has been by any Secretary of the Treasury at any time devoted to the first and second objects hereinbefore specified; and

Whereas, Every Secretary of the Treasury since the passage of the Bland bill has violated and disregarded said provisions.

Resolved, That our Senators and Representatives in Congress assembled, be requested to take without delay such steps as shall be necessary to ascertain why the Treasury department refuses to obey the statutory requirements and to insure their vigorous enforcement in the future.

Resolved, That it is the sense of the Committee on Resolutions that the question of hydraulic mining is a proper question for discussion before the Congress.

The following is the vote by States on these resolutions:

BY STATES	For.	Against.
Arkansas.....	4	.....
Arizona.....	2	.....
California.....	8	.....
Colorado.....	244	.....
Connecticut.....	5	.....
Idaho.....	10	.....
Illinois.....	1	.....
Iowa.....	2	.....
Kansas.....	5	.....
Maine.....	11	.....
Michigan.....	2	.....
Missouri.....	13	.....
Montana.....	20	.....
Nebraska.....	8	.....
Nevada.....	8	.....
New Mexico.....	2	.....
New York.....	2	.....
Ohio.....	33	.....
Oregon.....	10	.....
Pennsylvania.....	1	.....
South Dakota.....	14	.....
Texas.....	5	.....
Utah.....	18	.....
Vermont.....	2	.....
Wyoming.....	9	.....
West Virginia.....	1	.....
Russia.....	1	.....
Canada.....	2	.....
Totals.....	457	6

Hydraulic Mining.

The following resolution on hydraulic mining was read next:

WHEREAS, The Court of Last Resort of the State of California and the Circuit Court of the district including said State have practically inhibited hydraulic mining; and

Whereas, A commission, composed of eminent engineers in the service of the Government of the United States, has reported that mining by the hydraulic process may be conducted without material injury to the navigable streams of California, or to the interests of the owners of agricultural lands in said State; it is therefore

Resolved, That the Congress of the United States be respectfully requested to enact such law or laws as may encourage and rehabilitate the industry of hydraulic mining, upon the condition of the construction of such dams and reservoirs as may protect the agriculturists and the navigable rivers from the influx of mining debris,

Judge Goodwin moved that Chairman Searles be requested to give a dissertation on hydraulic mining.

Chairman Searles said he would gladly do so, but the talk of the Nevada and California delegations might be seriously affected, and nothing would be remembered of the brilliant efforts of the others.

The resolution was carried.

Protection of the Forests.

Mr. Crawford of Texas presented the following, which was unanimously adopted:

WHEREAS, The forests of the United States of America are being rapidly destroyed, and no adequate legislation has been inaugurated to replace the same or to stop such reckless destruction; and,

Whereas, Timber is indispensable in mining, and no doubt ever will be; and,

Whereas, We believe any generation avoids one of its highest duties if it does not, in the arrangement of all its public economies, contemplate the necessities of future generations; therefore, be it

Resolved, That it is the sense of the National Mining Congress that the legislation of the different States and Territories of the Federal Government should be directed to the prevention of further unnecessary spoliation of the forests now extant, and at the same time provide for the requirements of generations yet to come by encouraging the planting and cultivation of forest trees,

Mr. Crawford had another, which was adopted:

For the Fair.

WHEREAS, We are approaching the time of holding the Columbian Exposition at Chicago, which fair has been nationalized by the General Government; and,

Whereas, no section of the country more fully appreciates its importance than mining America; and,

Whereas, No section of the United States will receive greater benefits from its exposition of America; therefore be it

Resolved, That the National Mining Congress fully appreciates the splendid and liberal arrangements being made for the representation of mining and mining matters, and proclaims its hearty and full sympathy and support with the to-be-greatest fair and exposition the world has ever known.

Resolved, That this Congress extends its congratulations to the management of this great undertaking for the work already done, and also urges every State and Territory represented in this convention to prepare for and make exhibits commensurate with the importance of the exposition and the developed and undeveloped mining resources of the State.

Orange County Silver.

The Santa Ana (Orange Co.) Blade says: All the old silver locations throughout the county are at present showing up finely, while several new developments promise great things in the future.

A visit to the mines situated in the Silverado canyon, and about a mile above the old town site, shows the extensive workings that have been carried on there in the past year.

Dr. Danlap, one of the owners of the Blue Light mine, has been personally superintending the cleaning out of the old tunnel and making preparations for extensive operations soon to be carried on there.

The Blue Light is undoubtedly one of the richest silver-bearing mines in this section of the country. The reason that no work has been done on the mine is understood to be on account of the incongenial company as regards the owners—a desire being made to “freeze out” somebody. Of course, this is only rumor.

It will be greatly to the benefit of the county generally that this mine be opened up. There will be no necessity either of melting or concentrating works erected in that event, and the other mines already opened on the hill will be benefited thereby. The great distance from melting works, where returns may be obtained is a serious drawback to all the mines of the mountains. It takes a vast amount of capital and labor to open up and develop a mine, and should the surroundings offer further obstacles, in the way of reducing the ore, access for teams to the works, etc., additional sums of money and more hard work is required.

For many long weary months the Pellegrin mines have been prospected and worked, and only a short time ago was capital found to purchase a controlling interest, that the mines may be properly developed. A joint stock company has been formed, and a large force of miners is now actively engaged upon the works. These mines have rich assay returns, and although the ore must be sent to San Francisco the assays are most encouraging.

It is now contemplated to erect, near the Pellegrin mine, smelting works, and when these are completed, large sums of money will be saved. Custom work will also be received, and all mines will be benefited in their turn.

In the Trahna canyon may be found many rich developments of silver, and the persistency of the prospectors at least shows the faith they have of the future wealth in store for them.

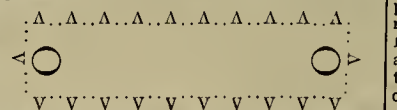
The late strike in the San Juan canyon, situated about nine miles north of the Hot Springs, has awakened a new interest in mining circles, and the old prospectors are jubilant. A four-foot vein of lode matter, said to assay about \$400 per ton, has been laid bare, and now that the hard work of discovery and prospecting has been finished, capital may be expected to step in and further the operation of extracting the ore and developing the mines.

As the county becomes more thickly settled, and wealth is offered as an inducement to come and locate, the many embryo advantages of the county will be taken up and worked to successful issues.

The Steam Sleigh.

An Invention Being Constructed in Truckee.

Truckee is likely to exhibit a piece of mechanism this winter that will revolutionize life in snowy countries, says the Truckee Republican. If the invention is a success, there will be no more trouble in paying a visit to the North Pole than there is going to the Sandwich Islands. In fact, excursions to the North Pole will become almost as popular as trips to the World's Fair. But the invention is not being perfected with the sole view of making Arctic excursions. There is something a vast deal more practical, namely, the traversing of snow-covered fields and mountains with a speed that will be scarcely less than that of railroad trains and the hauling of mammoth loads of freight, saw-logs or whatever else may require cheap and speedy transportation. All that is needed is that the ground be covered with snow, and although tropical countries will not be in it, all those portions of the globe that can boast genuine winter weather will come to Truckee and learn how to run snow railroads without the expense of laying iron tracks. The invention is secured by the necessary patent applications, and the perfected machine is now being built in Truckee. No one who has seen the plans and working models finds anything in the machine that is not perfectly practical. George Schaffer, the wealthy mill-owner, is having the sled built. He has the well-earned reputation of being a practical man, and when he backs an enterprise with coin, it must at least appear feasible. Mr. Amos Lane, the inventor, has kindly exhibited his plans to a reporter, and although a better idea could be conveyed by illustrations and cuts than by words, the main feature of the novel machine can perhaps be shown by mentioning the bare principle upon which it works. Given two broad sleigh runners placed a trifle farther apart than in the usual sleigh. Between these, in the front and hind portion of the sled, are two cylinders from two to six feet in diameter, strong enough to support a revolving belt. These cylinders, of course, are at right angles to the runners, and are so adjusted as to be easily raised or lowered. On the belt, also at right angles with the runners, are attached V-shaped cleats, which extend entirely across the space between the sleigh runners, being on the exterior of the belt. The general appearance of these cleats might perhaps be understood by imagining a strong belt on the inside of the following V's, represented by a dotted line, and that the belt revolved on the cylinders O. O.



Now if the cleats on the revolving belt just touch the surface of the snow, being so regulated that they can take a less or greater hold upon its surface, any one can understand that when the belt revolves, the sleigh runners must be propelled forward. The revolution of the belt is accomplished by a steam engine placed in the sleigh and connected with the cylinders. In the machine now being constructed, a vapor engine will be used instead of the ordinary steam engine, because it is lighter, and the sleigh now being built is intended only to carry passengers to Donner Lake, Tahoe and points around Truckee. The steering apparatus is merely a sort of rudder, or running board, which glides along on the snow a few feet in advance of the sled. This can be deflected to either side by turning a lever, and the sled will follow its motion. There are a number of interesting details about the machine which cannot be described in a brief article. The main point of the invention is the belt and cleats. It will readily be seen that the pointed shape of the cleats will prevent the snow from clogging them, and at the same time they will keep a firm hold on the snow, whether it is hard or soft. They will not injure the road, but, on the contrary, the roadbed will become better after each trip. Judging from the speed made by the working model, it will be entirely feasible to make ten or twelve miles an hour over ordinary roads, and where the country is level, there is nothing to prevent a speed of 60 or 70 miles an hour. On ice, the points of the cleats will be tipped with rubber.

The Refinery at Park City.

The Park Record (Utah) says: The experiment of refining the sulphides produced by the Marsao leaching plant by Stedefeldt's process is beginning to be a reality, and may even now be considered a complete success, as the remaining processes the matte has to go through are comparatively simple. The plant has been thoroughly tested down or up to the point where the copper is dissolved from the silver and gold by means of a sulphuric acid bath, and works to the entire satisfaction of Mr. Stedefeldt. It was calculated to manufacture a solution of sulphuric acid strong enough to dissolve the copper from the sulphur fumes arising from the matting furnace, but it proved to be too weak, and hence the acid will have to be purchased. Mr. Stedefeldt is satisfied with developments so far, and left for the West yesterday morning to make arrangements for acids and several other minor matters. He will stop at Butte a few days to look after a leaching

plant that is about ready to start up at that point, and then go to the coast, returning to the Park in about two weeks. A test of the product at its present most advanced stage showed an assay of 997 fine in silver and one of gold, which is nearly the pure stuff and indicates that when the process is complete and the bullion run into bars, it will be absolutely pure. The plant, it is understood, will be under the supervision of W. H. Bond during Mr. Stedefeldt's absence.

Electricity for Mining.

Mention has already been made in these columns, says the Montana Mining Journal of the proposed utilization of the Flint Creek falls to furnish power to different points. The scheme is further explained in a Phillipsburg special dated the 2d inst., which reads as follows: Seven miles from here, on the headwaters of Flint creek, works are being constructed which, when completed, will furnish power for all the mining camps near here. The Flint Creek Electric Power company was organized last June. The object is to utilize the series of falls that exist on Upper Flint Creek. The incorporators are C. M. Bennett, of Virginia City and Baker and Harper of Butte. The capital stock was fixed at \$25,000, with privilege of increasing at any time. This sum has already been expended this fall, and it is estimated that when completed the works will cost \$100,000. The incorporators have been watching this stream for several years, and find that they can depend upon from 2,000 to 3,000 miner's inches of water. In order to utilize this power a flume 6,600 feet is being constructed along the mountain side. The flume is three and one-half by four feet, and there are two tunnels, one 360 feet long, and the other 710 feet. The excavation for the flume has been completed, and the lumber is on the ground ready to be put in place in the spring. The dam is constructed of rock, is 100 feet in length, 12 feet high, and has a waste weir of cast iron pipe worked with automatic valves. The water supply comes from Georgetown flats where a number of springs exist. As the water issues from the ground it is warm and no danger is anticipated from the water freezing, as the distance to the works is so short.

At the end of the flume a tank with a capacity of 35,000 gallons will be built. From this tank a steel pipe, 30 inches in diameter and 1,300 feet in length, will extend down the side of the mountain to the power house. The tank is 658 feet higher than the power house, so there will be a fall of over 2,000 inches of water, 688 feet, or equal to 2,000 horse power. In the power house the main pipe branches into a number of smaller ones, by means of which ten Pelton water wheels will be fed. These wheels are high pressure and are capable of running ten dynamos. The entire power can be carried on ten heavy copper wires. In order to use power, motors are required at the end where power is used. It is probable that this power will be used at Granite, Anaconda, Rumsey, Phillipsburg and possibly at Butte. The plant is 17 miles from Anaconda and the company can deliver 80 per cent. of the power sent out; seven miles to Phillipsburg, and Granite and Rumsey, and they can deliver 90 per cent; they could deliver 65 per cent. to Butte.

It is probable that this power will be used in Anaconda for refining the copper, which at present is sent away for this purpose. There is already an electric refinery at Anaconda, which is said to be a success. The company began work August 13, and has completed the dam, the excavations for flume and pipe line, and expect to complete the tunnel before Christmas. Since the work began about 300 men have been employed. They expect to complete the work early in the spring. They erected a two-story boarding house with accommodations for nearly 100 men and have also provided a reading room for their employees. The company has an office at the works. When completed these works will be more extensive than any other of their kind in America.

RICHARDSON'S STEAM WAGON.—The steam wagon of the Richardson Bros. is making regular trips every day from the mill to the lumber yards below town. The distance is eight miles, yet the amount of lumber brought in every day is from 25,000 to 30,000 feet. Five wagons loaded with lumber constitute a load. When it is known that Mr. Richardson is really the inventor of the best portions of this wagon, Truckee should feel justly proud of its success. There is no reason why the steam wagon should not play an important part in the future of this region. If we must bide the time when business demands a railroad Tahoe and Sierra valley, we can at least know what roads for steam wagons could be built at once, and the expense fully justified by the freightage that could be obtained.—Truckee Republican.

A GOOD AIR WHEEL.—The Pelton wheel will run beautifully with compressed air. This afternoon water was turned into the new pipe which has just been laid on Mill street. The Telegraph pipe, that conveys water against the Pelton wheel that runs the press, was attached to a new water main. That main was filled with air which the water compressed and forced into the small pipe and against the wheel. The air was driven out with great force and before any water impinged on the buckets of the Pelton wheel the machinery ran most beautifully. The air made much more noise than does the water.—Grass Valley Telegraph.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

SUTTER CREEK.—Cor. Amador Ledger, Nov. 28: Sinking is going on at a rapid rate at the Wildman mine. They are now preparing to put in the eighth set of timbers. Calculations are now being made to start the mill again about the first of next month. The mill, during the brief period of idleness, has undergone a thorough overhauling, and will be in the best of order when the stamps are again set in motion. At the Hector, timbering and repairing the shaft will soon be finished, and the work of taking out the water will be inaugurated, which will take about a month to complete. The old pipe carrying water to the Belmont mine is being taken up, and the work of digging the ditch deeper in order to accommodate a new and larger pipe is in progress. Tunnel No. 1, is still being driven on the vein, and I am told they have cut some rich ore in the prosecution of this work, which they are saving and running into the ore bins. Several thousand feet of lumber have been delivered at the northern part of the claim for building a hoist over what is known as the old Boss shaft, which is to be sunk several hundred feet deep. This portion of the mine has never been prospected, embracing a distance of some hundreds of feet of virgin ground. The Lincoln is in operation and the ore is said to be paying well. The South Eureka is looking more and more favorable as sinking progresses, and the promoters are feeling very confident that the property will develop into a big paying mine.

WILL PAY.—Amador Ledger, Nov. 28: Everything indicates that the present operations at Quartz Mountain will turn out a success, and develop one of the largest mining enterprises in the county. Here, Nature has piled up inexhaustible stores of gold-bearing quartz, from which fact the deposit has been appropriately named Quartz Mountain. The gold is contained in fine sulphurets of high grade, said to yield as high as \$500 per ton. The sulphurets, however, are exceedingly fine, and have heretofore baffled all efforts to save them in paying quantities. Several appliances were tried, but all with poor success. A. B. Call, who has done a great deal in the way of handling sulphurets at the Gover, determined to tackle the quartz of this vicinity, putting in a sulphurets-saving plant after the Gates' method used at the Kennedy. The outcome has proved so satisfactory that the 10 stamps originally started are being reinforced with 10 additional stamps, and it is said 20 more will be added in the spring. Other claims about the old mountain are being revived, and the settlers thereabout are firm in the opinion that, after repeated failures, the district is at last entering upon a period of solid prosperity.

MISCELLANEOUS.—A cleanup has been made at the New York mine, being the first run of the large Huntington roller quartz mill recently erected on that claim. We are unable to give the exact result per ton, but the output is said to be something over expenses which is considered quite satisfactory for a first run on low-grade ore such as is met with in this claim. There are large deposits of quartz, which those well acquainted with that section say will pay if handled economically. The Stewart brothers are putting up a three-stamp Donnelly mill on their claim between Butte City and the Mokelumne river. The work of repairing the Amador Queen mine will be commenced to-day. Ed Kay and other carpenters have been engaged for this purpose. It is the Amador Queen No. 2, in Murphy's gulch, that is to be started up. This property, also the millsite, has been redeemed from the sheriff's foreclosure sale. Amador Queen No. 1, has not been redeemed, and the period allowed for redemption has expired.

Butte.

MAGALIA RIDGE.—Oroville Register, Nov. 29: The Butte Queen Co. has let a contract to run a tunnel 350 feet, so as to drain both the Butte Queen and the Butte King mines. When this has been constructed, these mines can be worked without having to pump any water from them, thus saving a large expense in working. Mr. Blagraves of S. F. has recently been elected president of the Butte Queen mine, and work under him will be pushed ahead with great vigor. D. K. Perkins has a force of men at work taking out ore, and this ore is of a rich grade. In the spring, a mill will begin crushing the same, when it is certain very profitable returns will be made. A large force of men are at work in the Mineral Slide. A Red Bluff company is opening what is known as the Linsey Bar gravel mine. Lumber is being hauled to the mine, and work is driven ahead with great expedition. This is on the lower end of Brown's ravine. The Harris & Patterson mine is being developed extensively. No work is being done at present in the Carr mine, nor will any be done till spring. The Gregory, Doyle & Co. mine has shut down till spring; owing to the depth of snow where that mine lies, it is difficult to work it in winter. Rich pay gravel is being taken from the Pershaker mine on the West Branch. This mine is certain to turn out much gold if a force of miners is employed. Astonishing reports come from the silver ledge near Lot's Lake. The owners have shipped a good deal of the ore to Denver, and the least that any of it has returned has been \$300 a ton. From this to \$700 has been what the ore yielded. The ledge is 37 feet wide, and ore has been taken from it at a distance in length of 400 feet. The shaft is down over 80 feet. It is thought by those who have examined this ledge that it will prove the richest silver ledge ever found on the American continent. One gentleman who is posted about the mine tells us that he is confident, that within two years, 500 teams will be engaged in hauling ore from the mine to the nearest railroad station for shipment to Denver.

GRANITE BASIN MINES.—The See & Jolly mine is turning out well and will prove very profitable. Arthur Christie has struck the vein in the Mexican, and has a large amount of quartz in sight. Wesley Bowers has found good rock in the shaft he has been sinking. The ledge is large and grows better as the shaft is sunk deeper. W. C. Graves, during the summer, took out considerable ore and crushed it in his four-stamp mill, which paid well. A. Swan has rich rock yielding from \$25 to \$30 a ton of free gold, besides being rich in sulphurets. Frank Early, dur-

ing the summer months, huilt a ditch and put up an arrastra to work some good rock.

Humboldt.

WILLOW CREEK MINES.—Blue Lake Advocate, Nov. 21: We may say that negotiations, which for some months have been pending, for transfer of the Willow Creek gravel mines to a San Francisco gentleman have practically been consummated. The claims, which thus pass into the hands of Mr. Murray Bailey of San Francisco, are scattered all the way from the South Fork of Trinity to and including P. F. Bussell's mine. They are gravel claims situated in the old bed of Trinity and are a valuable property. The impression prevails that Mr. Bailey is acting as the agent of English capitalists, and that this mining property will be in the hands of those with ample means for its full development.

Inyo.

PINE MOUNTAIN.—Register, Nov. 28: Mr. Douglass, representing Adams & Carter of San Francisco, manufacturers of the Frue ore-concentrating machines, has been engaged in putting up two of the machines at Pine Mountain. At that place, by the way, results are so far very satisfactory. The ore, of which there is a large supply, is crushed and concentrated, then shipped.

Mono.

DUNDERBURG.—Cor. Tuolumne Independent, Nov. 28: Work on the Dunderburg will be suspended as soon as the storms begin. The ore shipped to S. F. gave very satisfactory results, so much so in fact that the company has started a tunnel from Green creek that will tap the vein at a depth of over 1000 feet. The distance to be run is in the neighborhood of 3000 feet, and as the whole country is full of ledges we have no doubt many important strikes will be made before reaching the Dunderburg. This is regarded as the most important undertaking yet commenced in Mono county. It is too late in the season now for the company to get in machinery and erect the necessary buildings, but just as soon as spring opens it will be on the ground and the tunnel will be driven with the utmost speed. In the meantime two shifts will be kept at work steadily.

Nevada.

NORTH BANNER MINE.—Grass Valley Tidings, Nov. 28: With the new shoot of ore cut in the North Banner shaft, about three months ago, a large body of water was tapped. After some weeks the shaft was freed of water, but it has since developed that to carry on operations at the depth attained and greater depth, heavier machinery will be necessary. The altitude of the ditch from which water for power has been obtained, is not high enough, compared with the altitude of the works to furnish adequate pressure for a new and heavier plant, hence new power must be provided as well as new machinery. The management is figuring on the cost of raising the shaft from the tunnel to surface and erecting a steam plant. A plant with electricity as power has also been figured on, but we understand that the companies manufacturing electric power plants of this kind will not give a guarantee such as the management requires to protect the mine-owners in event of the failure or partial failure of such a plant. In all likelihood, the shaft will be raised to surface and a steam plant erected. It is estimated that the improvement will cost \$10,000.

THE PROVIDENCE MINE.—Transcript, Nov. 23: The San Francisco company that recently came into control of the Providence mine evidently means business. Col. Carl Davis, the experienced and successful mine manager, who is officiating as superintendent, has about 20 men at work now engaged in putting everything in shape for turning out gold. A large air compressor is being put in, and four tons of air pipe arrived this week. Pumps amply powerful enough to handle the water with ease are to be introduced. The shaft is being re timbered from the surface to the 1200-foot level, wherever the old timbers show signs of decay. The work of extracting the ore bodies now in sight and of opening up the "back" ledge is to be crowded. It is expected that before many weeks the entire complement of 40 stamps will be dropping again. The Providence is in a fair way to resume the place it held for so many years as the principal lullion producer of this district.

IMPORTANT FIND.—Grass Valley Union, Nov. 25: On the 2100 level of the North Star mine, 250 feet west of the shaft, the vein has opened out to the width of eight feet, and what is important, the ore is of excellent quality, showing in leaf gold. The widening is caused by the coming together of two veins, which will probably be the means of the vein continuing of large size in driving farther to the west and in the levels that may be opened at a greater depth. The find is very encouraging and will add to the reputation of this already valuable mine, which has been rapidly developed under the energetic management of Superintendent E. R. Abadie.

OSBORNE HILL MINE.—Grass Valley Union, Nov. 28: The bonding of the Osborne Hill mine to E. T. Wiltse, who represents a strong company, was completed on Wednesday, the bond being for two years. The mine, which is incorporated, is owned by Wm. Campbell, Mrs. J. L. Smith and Robert Smith. It is the intention of the new company to put up steam hoisting works of sufficient capacity to exploit the mine considerably below the old workings. The Osborne Hill at one time was a noted mine, and there is every reason to believe that the property is very valuable, and only needs good management to be worked to profitable success. The location, which is 2000 feet in length, is on the Osborne Hill range. The rich character of the ore produced by the mine is well known to the old-time miners of the district, who regard the contemplated reopening of the mine as an enterprise amply justified by its history.

Orange.

THE SANTIAGO MINES.—Anaheim Gazette, Dr. R. S. Law, representing the San Francisco and Los Angeles syndicate who some four months ago bonded the Santiago Mining Co.'s mines east of town, was here Tuesday and engaged a force of 25 men to construct a wagon road from the mines to El Toro, the nearest shipping point. D. J. Sorenson was engaged as foreman of the work and will leave for the mines with his men, tools and outfit to-day. The building of the road will require about a month's time, but it is expected to have it finished before the heavy rains set in. He states that the four months' development work done at these mines

during the term of the company's bond has so well satisfied his people that they have decided upon at once commencing a systematic development and improvement of the property, and some very large contracts have been let in San Francisco of which we will be permitted to speak in the near future. Suffice it to say at present that mining will hereafter rank as one of our leading industries, and the opening of these mines will be of especial direct benefit to Anaheim. Considerable quiet work has also been done during the year in the Silverado mines, and some good deposits of ore have been uncovered which will assay well, and of which a large quantity is now on the dump and awaiting shipment.

Plumas.

PROSPECTING.—Bulletin, Nov. 28: More prospecting is being done in the vicinity of Quincy than for years. Jack Fogarty has been engaged at Clearmont, but has quit for the winter. He was working in gravel and has good prospects ahead. Terry & Johnson have also been prospecting near the same place, and they are reported to have a good outlook. Morton is at work on Shore's Hill. Wornley & Richards continue work on their claims known as the White Oak and Black Oak. They have run over 300 feet of tunnel in the direction of the ledge. The indications are that they will develop a good mine. Ex-Senator Kellogg is also doing prospecting work on the hills above Elizabethtown. That section of country has been famous for its rich product of gold.

CHINESE MINERS.—Yreka Journal, Nov. 28: The Chinese who own the Benz Bar claim, on Klamath river, according to the belief of careful observers, have taken out not less than \$200,000 during the past two seasons, and as high as \$10,000 in a single day. The Chinese at work in the claim are close-mouthed, and will not tell what amount of gold they are taking out. Several miners are positive this claim is paying even better than the old Kanaka mine, just above, in its best days, where 400 ounces were taken out in a single week.

QUARTZ VALLEY.—Senator R. H. Campbell has sold his Quartz Valley hydraulic claims to an English syndicate, who has formed a company known as the Quartz Valley Gold Mining Company of California, limited. The capital stock is to be \$105,000, or \$525,000, and the working of the claim is to be under the supervision of Chas. Roberts of Oakland, as manager and engineer, who has been in London negotiating the sale. This sale to capitalists is a commencement from the Act passed by the Legislature repealing the law declaring Klamath river a navigable stream, with certainty of more sales and opening of deep placer mines throughout the entire northern part of the State that will pay handsomely if capital is invested to develop them. The quartz-mills on Humburg creek are kept running constantly with an abundance of quartz to continue operations day and night; in fact, more quartz-mills are needed to supply the demand from various new claims now being opened on Humburg and in this vicinity. A first-class custom mill on Yreka Flats would no doubt pay handsomely in crushing quartz from Humburg Gulch, Greenhorn, Cherry Creek and various points along the east side of the Humburg range of mines, or dividing ridges between Yreka and Humburg creek. The Schroeder & Werner quartz mine at Deadwood continues to yield good pay as usual, and in a few days more a night shift will be placed in the mill, to crush day and night during the winter season. The work of running an incline shaft on the coal mine at Willow creek is continued steadily, developing a fine deposit of coal that will prove highly valuable in the near future, when taken out in large quantity to supply the market. The company has already expended between \$5000 and \$6000 in prospecting and opening the mine, taking out considerable coal at the same time.

FROM GRANITE BASIN.—From Mr. Waldron, who was in from Granite Basin Monday, we learn that Mr. Swan is crushing some very rich ore from the Homestake mine. That previously crushed yielded as high as \$25 per ton, and the indications are that the ore now being milled will yield a great deal more. Mr. Swan has a five-stamp mill, run by water. Mr. Waldron is very much elated over the outlook for the property, which he and Mr. Hubbard have bonded. See & Jolly are extracting ore from their mine to crush next spring. The ore is of high grade. It is expected they will make a fine run next season. Mr. Graves continues work on his mine, from which he crushed ore all last summer.

THE GOLDEN GATE QUARTZ MINE.—Plumas Co. Bulletin: This property is about eight miles northwest of Quincy, and is owned by Messrs. J. B. Sutton, Jo Braden, Henry Orr, Wm. Richards, E. J. Barker and J. W. Larson, who located it last spring. It had been worked in early times, and was then known as the Jackson mine. Quartz was then not much sought unless very rich. The more the present owners investigated their property, the more were they satisfied that they had a good mine. They proceeded with development work, and with improvements. A five-stamp mill was fitted up, roads and cabins built and the extraction of ore begun. Crushing began about the first of August. The owners inform us that the product of gold was such as to yield the company a handsome profit. The mine is full of promise. The ore vein, from 1 to 6 feet, has been traced 3000 feet on the surface. During the past two months the mine was in litigation, but the title was settled in court last week. Development work will continue during the winter, and the crushing of ore will be resumed next spring.

RICH CHIMNEY OF ORE.—From Supervisor Thompson, we learn that, several days ago, a rich strike was made in one of the tunnels of the Halstead mine at Rich Gulch. Assessment work was being done in what is known as the English tunnel, well up on the side hill, which had been run to crosscut the vein. The vein had been reached, and the men were following it when they struck into a rich chimney of quartz, which shows free gold. It is considered a high grade of ore, but the extent of the chimney is not yet known. The ledge is about six feet wide. The property is owned by the Halstead Bros., who are much elated over the discovery just made.

San Diego.

OUR GOLD BANK.—Julian Sentinel, Nov. 28: Despite the bank failure, work among the mines is steadily progressing. This is where Julian over-reaches her neighbors of the coast. We have a great, rich and exhaustless bank among the auriferous veins that course our hills. Many men are at work constantly endeavoring to reach the bottom,

but like the magic pitcher of old, the bottom never comes.

Shasta.

PLACERS.—Redding Free Press, Nov. 28: Mr. Hiatt of Buckeye is hard at work digging a race and getting ready to work rich placers by the time the winter rains set in. W. D. Biegle showed us some rich rock from a new discovery above Shasta. He says that he is interested and has enough ore on hand to ship. Kirk Spaulding was in Redding on Wednesday with a fine sample of ore taken from his mine on Nigger Hill, a mile and a half from Shasta. He has a 12-foot ledge, rich in free gold and sulphurets. John Tiffin, the pioneer placer miner, is making good wages in the Lower Springs district on an old location rich in pockets and seams. At present he is fixing up a mammoth self-shooter, intending, when the water comes, to wash off the entire hill. Joe Penrose of Shasta informs us that he has bonded his mine on Gambler's Gulch to San Francisco parties for \$10,000, the bond to hold good for eight months. Aug. Blohm of Mott, who, with his wife, was in Redding Thursday, informs us that, with J. W. Hare, he obtained a sack of auriferous sand from the bar at the head of the Sacramento river below the Indian rancharia, the place where, a few years ago, Fred H. Deakin conducted a placer mine. This sand was obtained at the instance of Walter Deakin and has been shipped to Colorado, where a company has extensive machinery erected to work gold-bearing sand. It is claimed that sand yielding 50 cents per ton can be successfully worked. If, upon investigation, the sands prove rich, a plant costing \$40,000 will be erected here.

NEW MILL.—Shasta Democrat, Nov. 25: A new stamp mill will shortly be put up on the Little Nellie mine, Iron mountain. Mr. Hart, the proprietor, will make extensive developments on the mine this winter.

BULLYCHOOP MINES.—The great mining suit of Cromwell vs. Foster, et al, came to an end in the Supreme Court, last Thursday. The decision of the lower court was affirmed, in favor of Foster, et al. The litigation was over the Bullychoop mines, and the decision leaves the property free from entanglements.

TELLURIUM.—More telluride ore, also carrying free gold, showed up in the west drift of the Salt Creek tellurium mine a few days ago. Peter Scherer, the superintendent, is in San Francisco.

Trinity.

GLOBE.—Trinity Journal, Nov. 28: J. N. McDonald came in from the Globe mine this week, having completed the construction of the mill and got everything in running order. The job was quickly done, and from what we have learned, we judge it is well done, and all that is now needed is a little water to supply the boiler and battery.

HAND-MORTAR ROCK.—Shasta Democrat, Nov. 25: We hear that Jack Strode, of Whiskeytown, and another party, recently located and are now developing a very rich prospect in Trinity county, near J. E. Carr's ranch. They have a big ledge, from which they are taking out hand-mortar rock.

Tuolumne.

BONANZA.—Tuolumne Independent, Nov. 28: The Independent is authorized to announce that the Bonanza mine, which has been closed for several months pending the outcome of a dispute between the owners of the ledge and the owners of town lots under which it passes, will shortly be reopened. This will be pleasant news to the citizens of Sonora, as over \$4000 per month is disbursed at the mine, and it is in every way to the interest of the town and county that this mine, which has already produced millions of dollars, should be worked. It is understood that work will proceed only in certain portions of the mine until the suits are finally disposed of.

BADGER.—The tunnel of the Badger mine is now in 225 feet, and within about 71 feet of the chute. A shaft was first sunk on the vein to a depth of 220 feet. The vein averaged four feet in thickness, and a milling test of surface rock showed \$9 per ton. Ore was found in the shaft from surface to bottom. The tunnel is being driven with a view of tapping the vein 700 feet north of the shaft. The exposure of such a body of ore with a chance to stoep will of course add greatly to the value of the mine. The property is owned by a Gilroy company, of which Geo. Stayton is a member and superintendent.

SARATOGA.—The Saratoga Mining and Development Co. is still pushing work at the Saratoga mine on Harding's ranch, or Fales' place, near Shaw's Flat. Mr. Fales bored a hole some 15 years ago on top of Table mountain, and reached the gravel of the ancient river-bed. He then ran a tunnel into the side of the mountain, but at too great an elevation to intersect the old river-bed above the water level of the basin. He was, therefore, compelled to abandon his work. The Saratoga Co. commenced lower down, in order to secure drainage. They have worked two years and three months on the tunnel, and are now exactly 500 feet from the point of beginning. One hundred and thirty feet of the rock had to be blasted. They are now very close to the old river-bed, having recently passed through the rimrock, or syncline. The miners think they are not more than 75 feet from the trough, and perhaps much less. The gravel of the ancient river channel under Table mountain is known to be very rich, and this company surely deserves a rich reward for its persistency.

Yuba.

NEW WORKS.—Grass Valley Tidings, Nov. 28: The Jefferson Gold Quartz Mining Co., comprising Marysville citizens operating in Brown's valley, Yuba county, are arranging to erect hoisting works and a mill that will crush 200 tons per day. But little intelligent work has been done in the Brown's Valley district since the early days.

NEVADA.

Washoe District.

ORE EXTRACTED.—Virginia Enterprise, Nov. 28: There has been no change in the quality of the ore being extracted from the stopes on the 200 level of the Belcher. The battery samples show an average value of \$21.26 per ton. The old north lateral drift on the 300 level, which is being re timbered and repaired for the purpose of getting under the ore in the 200 stopes, has been cleaned out 68 feet. When the ore is reached from this drift some new developments may be expected. The ore in the winze on the 1350 level of the Alta remains about

the same. This ore undoubtedly extends down to the 1450 level. The Cornish pumps will be overhauled and started as soon as possible and the water drained from the 1450, after which they will drift in and intersect the ore and then upraise and connect with the winze. This will give about 130 feet of backs for stoping, as the winze is an incline one.

SAVAGE.—During the week we have hoisted 723 cars of ore from the 500, 750, 950, and 1100 levels, and shipped to the Nevada mill 525 tons, and milled 530 tons; average battery assay, \$18.50. We have bullion on hand amounting to \$21,284. The west drift from the new station, Potosi tunnel level, was advanced 27 feet, making its total length 700 feet from the shaft; face in low-grade quartz. On the 1100 level west crosscut No. 1 was advanced 25 feet, making its total 116 feet; face in clay and quartz. On the 1450 level the northwest drift is advanced 120 feet. We have temporarily discontinued work in No. 2 west crosscut, 1500 level, also in the upraise, Suro tunnel level. We have shipped 56 tons of ore to the Mexican mill to be worked by the new Japanese process.

CONFIDENCE-CHALLENGE.—The joint Confidence and Challenge north lateral drift, 200 level, is 872 feet from west drift from Yellow Jacket shaft, 12 feet having been made during the week; face in quartz of no value. The joint Confidence and Challenge drift on 300 level is now in 545 feet, 13 feet having been made during the week; face in quartz of no value.

HALE & NORCROSS.—On the 1630 level the north lateral drift from the new station is advanced 50 feet; face in clay, quartz and porphyry. On the Suro tunnel level the north drift started from the station, was advanced 25 feet; face in porphyry and streaks of quartz. From the face of the west drift, started south of the side of the incline, we have made an upraise for a chute 25 feet, and connected with the west side of the incline. This chute, which will answer for dumping purposes for all rock from the upper levels that may be sent through the Suro tunnel, will be finished the coming week. Have sent through the Suro tunnel 532 cars of waste rock during the week.

JUSTICE.—The east drift, 622 level, was cleaned out and retimbered 18 feet during the week; total, 148 feet. Started a raise on the north line, 822 level, which is up 13 feet in ore of fair quality.

SEG. BELCHER.—The main west crosscut from the south lateral drift, 600 level, has been advanced 19 feet during the week, making its total length 441 feet. The face is in a mixture of porphyry and low-grade quartz.

SCORPION.—On the 900 level the joint north drift from the Union shaft is now advanced 636 feet; face in porphyry and slips of clay. Water from the face of this drift about the same as at last report.

KENTUCK.—The north drift from the Crown Point, west crosscut, 500 level, has been advanced seven feet, and is now out 99 feet. Have started a west crosscut from it at a distance of 85 feet in or about 50 feet in Kentucky ground. The face is in porphyry and low-grade quartz. Are still opening on the pay streak south, above the south drift from the north raise, 1000 level, with no special change to report for the week. The east crosscut from the north winze, 1000 level, is out a total distance of 31 feet. The face is all in quartz of low grade, with isolated spots of ore through it.

BELCHER.—North drift from the 300 level station is now out 68 feet, having been cleaned out and retimbered 42 feet during the week. There is no change to report of the 200-level stop since last report. Have shipped to the Brunswick mill 146 tons and 980 pounds of ore, from which we have so far received two battery samples which average \$21.26 per ton.

YELLOW JACKET.—Shipping 40 tons silver-bearing rock to the Vivian mill daily, and 100 tons of gold-bearing rock to the Santiago mill. The usual prospecting work is being done.

CROWN POINT.—East crosscut No. 1, 500 level, is out 66 feet, having been extended 24 feet since last report. The face is quite wet, and is composed of porphyry and quartz, giving low assays. The west crosscut from the south lateral drift, 600 level, was advanced 24 feet, and is now out a total distance of 255 feet; face in porphyry with small streaks of quartz through it.

CON. CAL. AND VA.—There has been extracted from all parts of the mine during the week 1012 tons of ore, which was shipped to the Morgan mill. The average assay value of all the ore worked at that mill during the week (980 tons) was \$23.10 per ton. Bullion shipped to Carson Mint, assay value about \$11,676.89.

ARIZONA.

WEAVER.—Mohave Miner, Nov. 24: A number of miners came in from the mines of Weaver district last Saturday. From their statements the country for miles around is one mass of ore running from \$10 to \$500 per ton. There are now about 60 men at work in the camp and more are going in there daily. The two mills will be in working order by the 1st of January.

THE RAINBOW is being steadily developed, 10 men being employed. The upper tunnel is being driven into the mountain and two drifts run from the bottom of a 50-foot winze in the lower tunnel. All the works show plenty of good ore, enough being taken out in development to pay all expenses. Five hundred sacks of ore were packed down to the landing at the Rattler landing last week, and 300 sacks still remain on the dump awaiting shipment. Some wonderfully rich ore is being encountered in the bottom of the main shaft of the Distaff mine at Chloride. A 30-pound chunk of solid native silver was recently extracted and forwarded to Denver, Col., as a specimen, and solid chunks of native silver as large as one's fist, are being taken out almost daily with the ore.

BRITISH COLUMBIA.

A GOOD COUNTRY TO PROSPECT IN.—Nelson Miner, Nov. 20: While it is yet too early to make any statements as to the extent or permanency of the ledges in the Sloan country, enough is known to warrant the Miner in stating that the country is one worthy the attention of both the prospector and the investor. The country is large, unprospected, and has every appearance of being a mineral one; it will be easily accessible in the spring both from Kootenay lake and from Nelson; the ore is of a

character easily treated, and of a grade that will stand shipment to the United States, if there should be no home market; it is not a claim country, as enough locations have already been made to give investors a chance to select a "winner." Although discovered after the first fall of snow, fully a hundred prospectors and miners have paid it a visit, and they all return with similar reports, that is, that the country is a good one and has a future. The formation is limestone and schistose shale; the gangue, dolomite and quartz. The vein matter carries a good percentage of iron. The ore is galena and carbonates and assays from a few dollars to hundreds of dollars per ton in silver; it is free from refractory elements. From the lay of the ground many of the claims can be easily developed by tunnels, and little machinery will be needed for the first year or two. There is an abundance of timber, much of it white pine. Eligible sites for reduction works are not lacking. In fact the country has nearly all the natural advantages that are looked for by mining speculators, without whom no new country can be speedily developed, however rich.

DAKOTA.

THE D. AND D. SMELTER.—Deadwood Pioneer, Nov. 24: Refining furnaces from Fraser & Chalmers came in Saturday, and will be placed in position at once. A new blast furnace and a new blower have been added to the plant. There is considerable misunderstanding about the shutting down of the plant. It has never been wholly closed down. The crushers and sampling works have never been closed for a moment. There are and have always been at least 12 teams constantly at work hauling ore, pyrites and limestone, in addition to that delivered by the D. C. railroad, the control of which belongs to the owners of the smelter. A large contract for the copper-bearing pyrite has been made with Utah mine owners, the first shipment of which is in transition. The all important question, why is the plant not in blast, remains unanswered. In answer to the reporter, the superintendent, Dr. Carpenter, said that he thought that the reason which would most readily occur to any one would be that given by the Pioneer, that the process is in some way unsatisfactory, but that the next run would decide the matter definitely. In our opinion, the reason is that one furnace alone could not be made to pay—could not compete with outside smelters. That it is not so much a metallurgical problem as one of competition. We understand that the owners of the smelter have already invested in the plant and purchase of ores about \$200,000, and expect to increase the amount to half a million when in full operation. The larger the plant and greater the facilities, the lower will be the rates for treatment. The mills and hoists of the Homestake and associate companies are good illustrations. The low-grade ores of the belt could not be successfully treated with a 20-stamp mill, neither can the refractory or silicious ores of Ruby and Bald Mountain be successfully treated with a one-stock smelter.

IDAHO.

EVOLUTION DISTRICT.—Wardner News, Nov. 28: Without any booming or extra flourish of trumpets, Evolution district is rapidly coming to the front as one of the most promising mining sections in the Coeur d'Alenes. Col. J. H. Davey & Son have taken charge of the Argentine mine, and are rebuilding the tramway, ore bins, etc., preparatory to shipping. There are in sight at present on this property between 15,000 and 20,000 tons of ore ready to break, and the mine is in good condition to commence operations. A sale of 10,000 tons has been already contracted for, and the owners expect to be ready to ship by December 1st. The mine is opened to a depth of 340 feet containing three levels, and a force of 30 men is kept constantly employed.

BULLION.—De Lamar Nugget, Nov. 24: The semi-monthly shipment of bullion made by the De Lamar Co. last week amounted to 9074 ounces, valued at \$4,454.72. This is slightly below the amount usually shipped in the middle of the month, the falling off being accounted for by two days' stoppage of the mill while shifting the power to the new engine. Work is progressing rapidly on the mill extension, the additional pans and settlers being all in place. In a few days more the capacity will be increased.

MONTANA.

HELENA MINES.—Helena Journal, Nov. 25: That the gold belt south of Helena is attracting attention is fully evidenced by the fact that the district is almost daily visited by representatives of mine operators, who are ever ready to investigate a mining proposition, regardless of its locality or past history. Such a one visited the properties yesterday, upon his return expressing his surprise that more active development work was not in progress. He stated that he considered the old Union more promising than when the pick of the discoverer brought to light the first piece of gold-bearing quartz. The present conditions for the economical working of the ore being so advantageous, compared to those existing when the property opened, insure immense profits where formerly fair pay only could be expected. The mountain of ore being worked by John Winscott through his ten-stamp mill on Big Indian Gulch proved to him a veritable revelation. "Why," said he, "a hundred-stamp mill could not reduce the ore in sight within a generation; and this is the feeling the situation inspires in a man who has visited every known mining district in America."

ANACONDA.—Butte Bystander, Nov. 21: The shipments of ore from the Anaconda properties has been increased to about 110 cars daily, which will amount to about 3300 tons. This is about the capacity of the lower works. Men are employed on the upper works getting them in order, and gradually the output of ore will be increased until a sufficient supply has accumulated to operate the whole plant. The company has sufficient coal on hand to warrant operating both works, and all that is lacking is the ore. Men are being employed at the mines here every day. The Wake-Up-Jim will soon begin to add its output of ore to that of the other mines, and before New Year's the output will probably reach 5000 tons daily. The operations of these great properties is already being felt not only in Butte, but in Missoula and the Bitter Root

Valley; at Elliston, at Rock Springs, Wyoming, and in fact all over the West, and its continued operation will swell next year the output of the mines of Montana several millions.

Mining Share Market.

The Comstock mining shares the past week hung around up to Monday at about the closing prices given in our last week's review, when they began to shade off under more active manipulation for lower prices through cross orders. The reported inside bear broker made another raid on the North End shares, which naturally affected the entire list and enabled quiet buying, by other brokers for the pools, of shares thrown out by outsiders. There is everything to warrant the assertion that the pools are taking advantage of the rough developments in the suit of M. W. Fox against the directors of the Hale and Norcross mining company, to frighten outside holders of the shares in the different mines to sell, and to do this more successfully, they continue to throw bombs (assessments) so as to make a complete and thorough scare.

The developments in the suit against the directors of the Hale and Norcross will most unquestionably be of the greatest possible advantage to the share market, and dealers will realize that fact before they are nine months older. The mines will, in the future, have to be worked according to the mining corporation laws of California, which means dividends and not assessments; and the pools, realizing this fact, have been and are still quietly picking up stocks, and the lower they can buy, the better for their purposes, but to get still more, it is morally certain that they will be compelled soon to enter the market as active buyers, and bid up for stocks and then outsiders, if they desire, can sell at a large profit.

The expose in the Hale and Norcross suit is raising the question if the directors of the company are not liable to criminal prosecution. It now looks as if they had been, to put it mildly, criminally negligent in their official capacity. Others outside of the officials, it now looks, have made themselves liable to prosecution, which may land them behind iron bars.

It is said by well-informed miners that news from the Comstock mines is being systematically suppressed, so as to help the pools to buy up the shares at low prices, but notwithstanding this, we are in position to affirm that the mines never before looked so promising as the work of developing the various levels proceeds. In last month a rich strike to the west was made in one of the Gold Hill mines, which undoubtedly brought about the break in prices. The strike was not looked for so soon by the pool at that end. In Belcher they are developing on the 200 and 300-foot levels a west ledge 40 to 45 feet wide, which is good to high-grade ore. In 1889, in the same mine, they ran into a four-foot ledge of rich ore on the 1100-ft. level, which was found to be 40 feet wide on the 1200-foot level and assayed up to \$50 a ton. Since then a mysterious silence has been maintained regarding this important find. In Crown Point and Yellow Jacket important development work has been and is being made; the same remark applies to Confidence and Challenge. A mysterious silence is still maintained regarding the rich strike officially reported last year by the Superintendent of Con. Imperial. The find was near the Alpha line and officially given at 10 feet wide, and assaying from \$30 to \$40 a ton. Since then the stock has been unduly depressed and regularly assessed. Is it not about time for officials to report the ore found in running the Ward shaft? The west drift on the 1800-foot Ward shaft was started for the purpose of striking the rich ore found several years ago in Potosi on the 2400-foot level, and from which the water drove them out. In Savage and Hale and Norcross active development work is under way; both mines should be paying dividends, as should Gould and Curry. Important news is expected to be received any day from the work now being pushed in the North End mines.

From the outside mines, our advice report that in the Quijota district the Peer and Peerless will start up next week on ore assaying about \$40 a ton, and as the ore is ready for crushing, and no expenses to be incurred, dividends are to be in order. Several of the Tuscarora mines are shipping high-grade ore to Salt Lake for milling. Dividends are confidently looked for soon. Coptis in that district continues to pay dividends. In Bodie district they will shortly start up the mill on the accumulated ore now on the dump and in the mine ready for shipping. Both Bodie and Bulwer have large quantities of rich ore on the dump. The mines in the Candelaria district have shut down. Miners asked too much wages.

The Comstock mining shares act as if they will touch the low prices by Saturday that insiders said some time ago they had to come down to.

The following law is interesting reading, and may prove quite expensive to those brokers who have been evading it:

Section 587, Civil Code, Sec. 2, of an Act for further protection of stock in mining companies:

All stock in each and every mining corporation in this State shall stand in the books of said company in all cases in the names of the real owners of such stock, or in the name of the trustees of such real owners; but in every case where such stock shall stand in the name of a trustee, the party for whom he holds such stock in trust shall be designated upon said books and also in the body of the certificate of such stock.

A movement is on foot to oust the Levy-Harmon combination from the management of the Savage Mining Co., which will be followed by throwing them out of the Hale & Norcross management. Let the good work extend to all the mines on the Comstock run in the interest of the mill ring.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 24, 1891.

- 463,943.—POTATO DIGGER—J. W. Cook, Jefferson, Or.
- 463,791.—WATER TANK—F. X. Fischer, Oakland, Cal.
- 463,792.—WATER-WHEEL—Walter Galbraith, Santa Cruz, Cal.
- 463,964.—BASKET—C. E. Gates, Oakland, Cal.
- 463,727.—RAILWAY SWITCH—A. M. Grubbs, Forest Grove, Or.
- 463,728.—RAILWAY FROG—A. M. Grubbs, Forest Grove, Or.
- 462,902.—FEEDER FOR HEATERS—Wm. Jones, La Grande, Or.
- 463,912.—MINER'S TOOL—R. A. McVitty, Snohomish, Wash.
- 463,795.—DIRT-SCRAPER—D. F. Oliver, Oakland, Cal.
- 463,869.—DUMPING CAR—C. D. Page, Tacoma, Wash.
- 463,966.—AGRICULTURAL MACHINE—J. E. Reed, Los Angeles, Cal.
- 463,649.—BUILDING MATERIAL—J. O. Rollins, Forest Ranch, Cal.
- 463,875.—PROCESS—A. Sommer, Berkeley, Cal.
- 463,997.—PRINTING PRESS—H. Swain, S. F.
- 463,927.—FIGURE TOY—G. Y. S. Wada, S. F.

The following brief list by telegraph, for Dec. 1, will appear more complete on receipt of mail advices:

California—William J. Brennon and C. A. Pitcher, Needles, sheep and boiler cleaner; Joseph Craig, Woodland, fruit; Anson W. Delane, San Diego, device for packing fruit; San Francisco, rock drill; Adam Heberer, Alameda, furnace for steam boilers; David G. McFar, Santa Ana, fruit-gatherer; Max Meyerberg, Los Angeles, chandelier display hanger; Joseph Pettibon, Oakland, dust guard for car axle boxes; Hadwen Swain, San Francisco, printing press; Myron K. Gibson, Ukiah, bicycle. Oregon—John B. Mahana, Froewater, method of and apparatus for the propulsion of trains. Nevada—William A. Hawthorne, Carson City, support for beehives.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WATER TANK.—Frank X. Fischer, Oakland. No. 463,791. Dated Nov. 24, 1891. The object of this invention is to provide for keeping the joints of liquid tanks tight under all circumstances. It consists in a channel formed with or secured to the upper portion of the tank, said channel being adapted to receive and hold liquid, which, by absorption, passes into the pores of the wood and keeps it moist, thereby preventing shrinkage. Water tanks are generally made of staves bound together by hoops. When the tank is full, the wood swells and the joints become tight, but when the staves become dry, as they do when the water in the tank is low, the wood shrinks and the joints open. The tank will then leak. This shrinkage is of permanent disadvantage to the tank and requires frequent attention and driving down of the hoops. This difficulty is specially noticeable in climates where there is a long season of drouth and calms, attended with heat, especially in the interior of this State. The water in the tanks gets low and the whole upper portion shrinks and permanently injures the tank. There being but little wind to operate the mill, it is impossible to keep the tank full, but by keeping water in the channel it will soak into the wood and keep it moist. There is generally enough wind to raise some water frequently. Now, by introducing this water to the tank through the intervention of a suitable channel at the upper portion, the water will not only soak into the wood, but the surplus can be directed downward upon the inner surface of the tank, thereby keeping it wet and preventing shrinkage. Therefore, whether the tank be full or not, its joints will always be tight and the life of the tank will be considerably extended.

WATER-WHEEL.—Walter Galbraith, Santa Cruz. No. 463,792. Dated Nov. 24, 1891. This invention relates to improvements in water-wheels, in which the inventor seeks, first, by the arrangement of the step to avoid friction to the greatest possible extent; second, by the arrangement of the buckets to avoid interference with the water when applied to the wheel; third, by the shape of the buckets to utilize the greatest possible percentage of the force of the water; fourth, by a screw in conjunction with the step to make the wheel itself act as a gate, thus avoiding wear and tear from the effects of sand and rubbish; and fifth, by the simplicity of the combination of the wheel disk or shell and buckets to reduce to the smallest extent the loss from friction and the attrition of all substances that may be carried in the water. These objects the inventor claims to have attained by the construction described in the patent.

DIRT-SCRAPER.—D. F. Oliver, Oakland, assignor to Truman, Hooker & Co., S. F. No. 463,795. Dated Nov. 24, 1891. This is one of that class of dirt-scrappers in which a bowl provided with end runners and a rearwardly projecting handle is connected by pivoted links with a drag-bar, and is adapted to be turned over upon its runners to dump its load, said turning being limited by a suitable stop. The object of this invention is to provide a suitable and effective stop for this purpose, one which can be fixed at a certain point or can be rendered adjustable to vary the limits to which the bowl can turn, as may be desired.

THE Japanese earthquakes caused a loss of life of 7566 persons, and 10,121 were wounded. There were 89,629 buildings completely destroyed, and 28,628 damaged.

MECHANICAL PROGRESS.

Welding Tires.

A correspondent of the *Blacksmith and Wheelwright* gives some very valuable suggestions in regard to welding tires. He says there is no work which the jobbing blacksmith is called upon to perform that requires more care or skill than the welding and resetting of tires. In parts of the country in which the roads are dry and the heat of summer is high, the action of the heat is twofold; in the first place, it shrinks the felloes, and secondly, it expands the iron. In both ways, therefore, heat loosens the tire and makes resetting a necessity.

In the majority of shops, there is no such appliance as a tire-shrinker, and the tire must be cut and rewelded. It is difficult to understand why it is so, but the fact exists that in a majority of small shops there is a strong prejudice against that mode of shortening a tire, and the smiths are convinced many of his customers that the method is a bad one. This has made the introduction of this valuable adjunct almost impossible. The result is that welding must be resorted to, and many blacksmiths experience serious trouble in getting a good weld, even when, to all appearances it is all right.

The defect is generally at the outside point of the weld, on the head. The average tire, when welded, shows the outer point only partially joined. Sometimes it appears as if the point had been chilled and pounded down into, not welded to, the portion under it.

He gives an illustration which fully explains his method, but which we are unable to present. After properly measuring and placing the two ends for welding, they are first joined by a rivet, carefully and correctly placed in holes properly punched. After inserting and securing the rivet, reheat to a clear, red heat and rivet closely, taking care that the points are in their proper position. If a steel wire is used, apply a flux heat up to a welding heat, and with a wire brush, remove all flux and dirt of every kind before beginning to weld.

The face of the anvil needs looking to. Lack of care with regard to that causes much of the trouble met with in welding. Remember that the end of the piece to be welded is drawn down very thin, and it quickly cools below a welding heat when it is exposed to the air or comes in contact with a body colder than itself. If placed upon an anvil that has a cold face, the slight chill which results will prevent a perfect weld. Therefore, see that the face of the anvil has a temperature of at least 100 degrees, before the tire is placed on it for welding.

Having secured the proper heat and a perfectly clean surface, place the tire upon the anvil, and begin pounding at the lower portion of the weld, and work gradually up toward the other point. By working in this way, the welding is begun at the point where the iron is most likely to lose its malleability, and it works out the flux and any other foreign substances that may be between the plates. After making a perfect weld on the flat, turn and pound the edges before the welding heat is gone. If the tire is of steel or very thin iron, I do not recommend working the edges. A better way is to remove all surplus material with a cold chisel and a file. When all is tried up to the proper thickness and width, reheat and reduce to the proper shape, using a light hammer for the purpose.

The blacksmith who will follow this method closely, using a clean fire when making his heat, will find no difficulty in making a clean, strong and even weld, no matter whether the tire be heavy or light, iron or steel.

BALL BEARING FOR CABLE RAILWAYS.—The sheave bearings for cable railways are subjected to constant and heavy friction, particularly around curves, and requires an enormous power to merely run the cable alone, which is greatly increased when dozens of cars are operated. The present invention is designed to save a large portion of this power, and also avoid the wear which is always incident to friction. Mr. Clarence A. Burton of Kansas City, Kan., has adapted the mechanically popular ball bearing to the sheave journals in such manner, that particular exactness of adjustment is not required, and vastly simplifies as well as improves the working capacity and endurance of the parts. The bearing blocks within which the ball groove is formed are made in two sections, horizontally separable, the half circle groove being formed in each and conjointly forming the complete bearing channel. These blocks are externally rectangular and fit snugly into a box casing, which is formed with axial trunnions that are suitably engaged in any desired form of bracket support. A draw slide serves to close the bearing box and excludes all trash that may drop into the cable way. The upper bearing section being independently removable, the operation of putting in the balls is exceedingly simple. The lower half can be filled, the spindle placed, then the upper section laid on, and the rest of the balls dropped in an office communicating with the ball groove. This admirable invention, it is claimed, makes it practicable to use this most desirable style of bearing, which will give marked results in practice.

A NEW ALUMINUM BRONZE RESISTANCE METAL.—The Aluminum Brass and Bronze Company at Bridgeport, Conn., announce a new

resistance metal in wire, sheet or castings, which seems to be a very important contribution to this class of material in electrical engineering. The wire samples resemble ordinary copper wire on the outside, and have a pinkish white tinge at the surface of fracture. The wire is very strong, without losing much ductility. The torsion test shows over 80 twists in six inches for an annealed wire, which still possesses 70,000 lbs. tensile strength to the square inch. The hard drawn wire, it is said, runs to 100,000 lbs. tensile strength, with about 40 twists in six inches. Combined with these admirable mechanical qualities, it is claimed that the wire has the remarkable resistance of 35 times that of copper with a temperature coefficient of less than one-tenth of that of German silver; furthermore, the wire is cheap. We understand that, by having the resistance lower than in the samples described above, the tensile strength can be increased up to 140,000 lbs. per square inch. These particulars relate to wires .080 inch in diameter or thereabouts.

EFFECTS OF COLD ON NICKEL-STEEL.—The consequences of allotropic changes, which result in alteration of structure, are very great. The case of the tin regimental buttons which fell into a shapless heap when exposed to the rigorous winter at St. Petersburg is well known. The recent remarkable discovery by Hopkinson of the changes in the density of nickel-steel (containing 22 per cent of nickel), which are produced by cooling to -30° , affords another instance. This variety of steel, after being frozen, is readily magnetizable, although it was not so before; its density, however, is permanently reduced by no less than 2 per cent by the exposure to cold; and it is startling to contemplate the effect which would be produced by a visit to the arctic regions of a ship of war built in a temperate climate of ordinary steel and clad with some 3000 tons of nickel-steel armor; the shearing which would result from the expansion of the armor by exposure to cold would destroy the ship. Experimental compound armor plates have been made faced with 25 per cent nickel-steel, but it remains to be seen whether a similar though lessened effect would be produced on the steel containing 5 to 7 per cent of nickel, specially studied by J. Riley, the use of which is warmly advocated for defensive purposes. Farther information as to the molecular condition of nickel-steel has within the last few weeks been given by Mercadier, who has shown that alloying iron with 25 per cent of the nickel renders the metal isotropic.

ADHESION OF BELTS.—Recent discoveries have made it almost certain that the adhesion of belts to pulleys is as the square roots of the arcs of contact. This is of importance in that it simplifies the method of calculating the transmitting power of belts; enabling all by a short process of figuring to determine about what a belt may be capable of doing under varying degrees of contact. It can be assumed as a basis that the effect of 180 degrees contact is 100. Then as the square root of 180 is to 100 so is the square root of any other arc of contact in degrees to its effect. Or, to be more explicit, divide 100 by the square root of 180 and multiply the product by the square root of the given arc of contact, the result being the effect as compared with 100. In making calculations of that kind it is perfectly safe to assume that any good single belt will transmit 1-horse power for each inch in width, the arc of contact being 180 degrees, and the lineal speed of the belt 800 feet per minute. Briefly stated, then, the transmitting power of belts is directly as to their widths, lineal speeds, and as the square roots of their arcs of contact. The arc of contact being the same the adhesion is the same on all sizes of pulleys. That is, a 180 degree arc of contact on a 24-inch pulley is, other things being equal, in all respects equal to a like arc of contact on a 48-inch pulley, and the one will transmit no more power than the other if the lineal speed of the belt be the same in both cases.—*Exchange.*

CEMENT FOR IRON.—The following is given as a mixture for joining pieces of iron together: Equal parts of sulphur and white lead, with about one-sixth proportion of borax, and the three constituents of the mixture, and the three should be thoroughly incorporated together so as to form one homogeneous mass. When the composition is to be applied it should be wetted with strong sulphuric acid, and a thin layer of it placed between the two pieces of iron to be connected, these being at once pressed together. The *Chemical Trades Journal* says: "It is stated that the cement will hold so firmly as to resist the blows of a steam hammer, and dry so completely in a few days as to leave no trace of the cement, the work then presenting the appearance of welding."

A NOVEL MACHINE for piling lumber, the invention of W. S. Riddell, may be seen in Vance's lumber yard. It saves much labor and the men using it are loud in its praise.—*Eureka Times.*

THE TELEPHONE between London and Paris has been extended beyond the latter city to Brussels and also to Marseilles, the latter a distance of 900 miles, over which distance it works well.

The cost of smooth-bore cast iron guns ranged from \$125 to \$150 per ton; now our rifled steel breech-loading guns cost from \$850 to \$1000 per ton.

SCIENTIFIC PROGRESS.

Meteoric Studies From Scientific Kites.

The *American Meteorological Journal* for July contains an article on Franklin's kite experiment by A. McAdie. After giving various details respecting Franklin's experiments, the author describes similar experiments recently carried on at the Blue Hill Observatory, near Boston, the chief advance being that at every step the electrical potential of the atmosphere was measured by an electrometer. The kite was sent up on several days, and at a height of 1000 feet sparks over one-third inch in length were obtained, while abnormal movements of the stream of water from the electrometer during electrical disturbance always foretold when a flash of lightning was about to occur.—*Cloud Heights and Velocities at Blue Hill Observatory*, by H. H. Clayton. This paper contains the results of cloud observations made at Mr. A. L. Rotch's observatory during the last five years. The average heights of some of the principal clouds were—nimbus, 412 meters; cumulus (base), 1558 m.; false cirrus, 6500 m.; cirrostratus, 9,652 m.; cirrus, 10,135 m. The cumulus is highest at Blue Hill during the middle of the day. The Upsala observations show that the base of the cumulus, as well as the cirrus, increases in height until evening, but neither of these conclusions apply to the observations at Blue Hill. The average velocity found for the cirrus (82 miles an hour) is twice as great as that found at Upsala.

The extreme velocity was found to be 133 miles an hour. A comparison between wind and cloud velocity shows that below 500 meters the wind velocity is less than the cloud velocity. Above that, the excess of the cloud velocity increases up to 1000 meters, and then decreases again till about 1700 meters, after which it steadily increases. This decrease between 1000 and 1700 meters is very probably due to the fact that the clouds between 700 and 1000 meters were mostly observed during the morning, when the cumulus moves most rapidly, and that the clouds between 1000 and 1700 meters were mostly observed during the afternoon, when the cumulus moves slowest.—*Meteorological Kite-flying*, by W. A. Eddy. This is an account of some experiments made at Bergen Point, N. J., to determine the vertical extension of warm air currents by means of self-recording thermometers carried by a kite string. Experiments showed that an altitude of 1800 feet could be obtained by using one kite, and that many hundred feet could be added to the altitude by lifting the weight of slack string by fastening on larger kites. It is estimated that by this means an altitude of 4000 feet was obtained. The minimum temperature at an altitude of about 1500 feet, on February 14, last, was only two degrees lower than at the surface.

HOW THE ANCIENTS TELEGRAPHED.—Telegraphy was practiced by the ancient Greeks and Romans. One method was the placing in pots, straws or twigs, saturated with oil. They were placed in rows and expressed certain letters according to the order in which they were lighted. Another method was that invented by a Grecian general who flourished in the time of Aristotle, intended for communication between the generals of an army. It consisted of two exactly similar earthen vessels filled with water, each provided with a cock that would discharge an equal quantity of water in a given time, so that the whole or any part of the contents would escape in precisely the same period from both vessels. On the surface of each floated a piece of cork supporting an upright, marked off into divisions, each division having a certain sentence inscribed upon it. One of the vessels was placed at each station, and when either party desired to communicate, he lighted a torch which he held aloft until the other did the same as a sign that he was all attention. On the sender of the message lowering or extinguishing his torch, each party immediately opened the cock of his vessel, and so left it until the sender relighted his torch, when it was at once closed. The receiver then read the sentence on the division of the upright that was level with the mouth of the vessel, and which, if everything had been executed with exactness, corresponded with that of the sender and so conveyed the desired information.

PREVENTION OF COAL-DUST EXPLOSIONS.—A German paper describes a new device, which has been found sufficiently successful to warrant its introduction into several German mines for the prevention of coal-dust explosions. The usual method of sprinkling water in dusty parts of the mine has only a limited value, as the dust is generated by the breaking down of the coal, and explosions may occur from the liberation of gases at the same instant. To meet such cases, the use of water has been given an entirely new application, the effect of which was somewhat a surprise at the first experiment. Holes one meter deep are drilled in a distance from each other of about three meters, wooden plugs are inserted, and through them iron pipes from three-quarters to one meter long, with openings between 2½ and three millimeters large, and connected with rubber hose. In the Camphausen colliery a pressure of from 8 to 10 atmospheres and injection through two tubes in eight hours proved sufficient to impregnate 61x1½ meters. In the Kreuzgraben colliery the water forced in under a pressure of

20 atmospheres during 16 hours moistened thoroughly the coal as far as four meters above the highest hole. Of importance for the successful application of this method are the water pressure obtainable, the quantity of water injected, and the firmness of the seam, the last item depending to some extent on the size of the coal pillars in the workings.

WHAT A MODERN GUN CAN DO.—Unless one is actually brought into business relations with the great science of modern warfare, says the *Boston Traveler*, it is difficult to conceive of the terrible power of the latest and largest guns. These engines of destruction, weighing 110 tons, hurl a projectile of solid steel 16 inches in diameter and nearly 4 feet long at a velocity of 2079 feet a second. When tested recently, one of these guns sent a shot through 20 inches of steel armor, 8 inches of iron, 20 feet of oak, 5 feet of granite, 11 feet of concrete and 3 feet of bunk. Comparatively, a locomotive weighing 200,000 pounds would have to spin along the tracks at a rate of 135 miles an hour to strike a blow equal to that projectile. Think of the damage wrought in a railroad collision where the train speeds along at the rate of 30 miles an hour, and one may estimate the destructiveness of modern ordnance.

HOW TO PRESERVE PLANTS FOR A BOTANICAL CABINET.—This question is answered by the "Scientific American Encyclopedia" as follows: The method consists in dusting salicylic acid on the plants as they lie in the press, and removing it again with a brush when the flowers are dry. Red colors in particular are well preserved by this agent. Another method of applying the same preservative is to use a solution of one part of salicylic acid in 14 per cent of alcohol by means of blotting paper or cotton soaked in it and placed above and below the flowers. Powdered boracic acid yields nearly as good results. The *Gardeners' Chronicle* recommends as an improvement in the method of using sulphurous acid for preserving the color, that in the case of delicate flowers they might be placed loosely between sheets of vegetable parchment before immersion in the liquid so as to preserve their natural form.

ELECTRIC COLOR TEST OF GEMS.—In pursuing his researches on the phosphorescence of gems under the electric discharge in a high vacuum, a scientist has found the light evolved to be of different colors, according to the origin of the stone. Diamonds from the Cape show a blue phosphorescence, those from Brazil a red, orange, blue or yellow, and those from Australia a yellow, blue or green light. Crystalline alumina—that is to say, the ruby, sapphire and corundum—phosphoresces a deep red, and give a spectrum of one or more lines. Yellow sapphire glows with a delicate lilac tint. Uncut specimens of phenakites become yellow and blue under the discharge, while green emerald from Ireland emits a deep red luster, similar to that of the ruby, but does not give the ormeon spectrum of that crystal.

AN AMERICAN SYSTEM OF EDUCATION.—Prof. Jordan of the Stanford University recently gave a very interesting lecture before the Unitarian Club of this city, on the "Methods of Education," in which he compared the educational institutes of the Old World with the New, and followed the student through the several stages of thought and development incident to a collegiate course.

"There is," said he, a general American system of higher education being developed, which will prove vastly superior to any now in vogue. Its growth is necessarily slow, but always appreciable, and while years will be required for its perfection and full development, the time will come when the older nations will take pattern after a system of education which has had its foundation in America."

THE PILGRIM FATHERS would be wonderfully astonished were they to rise from their Plymouth graves and witness the wonderful revolution which has been accomplished, since their landing, in science and the industrial arts; but it is a question whether they would be more astonished at the locomotive, the telephone and the steamship than at the revolution in religious opinions which have occurred in these latter days.

THE AURORAL LIGHT.—The theory of the light of the aurora borealis was evolved from the analysis of its light by the spectroscope, which showed that it was caused by electrical discharges among the particles of meteoric dust in the atmosphere. The broad red line of the spectrum of iron is shown in all these cases, and thus upholds the theory, as it is well known that the principal part of meteors is metal.

A NEW USE OF THE ELECTRIC LIGHT.—By means of electric light, a lot of tropical plants imported last winter for the Kew Gardens, London, were kept in health below deck during the voyage—when without this light they would be perished; since on deck in the sunlight the cold would have been fatal.

A NEW FRENCH INVENTION is a chloro-chromic battery which can be used on miners' lamps in connection with an incandescent lamp. It gives more light, weighs about the same as the oil lamp, and will not explode.

ELECTRICITY.

Electricity As It Is and May Be.

Electricity is working revolutions in almost every department of science, industry and commerce. The marvelous transformations which are being wrought throughout the civilized world by this new and wonderful agent is the marvel of the ages. Nothing like it has ever before been seen. The introduction and history of steam is tame when compared with it.

Electricity touches life and industry at every possible point, modifying, transforming and extending all previous methods and practices. It has already annihilated time and space. It will put a girdle around the earth in the smallest fraction of a minute. It connects the earth with the sun in an almost meaningless minimum of time. With all its wonderful and almost irresistible power, it is quite as ethereal as light itself, and we are fast finding out that it can be mastered, controlled and rendered as harmless as the most innocent thing in nature. Regarding it in all its known conditions in relation to time, space and force, may we not regard it as the means of differentiating; as the connecting link indeed between the material and the immaterial world?

All of this and more, especially when we consider that we have the fullest reason to believe that the immediate future bids fair to transcend all the realization of the past. From a mere toy, electricity has, within half a lifetime, made all of this advance. In regard to the future, it is quite as fresh to say "We shall not," as to say "We shall."

The Long-Distance Telephone.

Nothing, perhaps, in electrical progress, exceeds the history of the telephone. Its introduction marks an epoch. At first we knew it as a means of speaking only from room to room. It next passed out into the street, then along the suburban wayside to an adjoining town. Then it halted for a time. Gradually, long-distance telephoning became the dream of the scientist and inventor.

At first its voice was weak and almost inarticulate, even when the distance was recorded in rods. The scientist and the inventor kept steadily at work until we got the microphone transmitter, which was soon followed by the induction coil and other important accessories and assimilating elements, until we now have the long-distance telephone very nearly or quite fully developed. Continuents may now be traversed with, perhaps, relays at long distances, and there is good reason to believe that they might even now be fully traversed by more expensive appliances than economy would, just at this time, warrant. In fact, arrangements are even now being made to telephone across the Atlantic. That the experiment will be successful, who that knows, can doubt? The tick of a watch can now be heard by the submerged wire between Dover and Calais, and the telephone between London and Paris is proving a big success, scientifically, commercially and financially. Electricians say there is no telephone circuit in London, or in England that works so clearly and perfectly.

The telephone will soon become as important to international commerce as it now is to that between town and town, although we have as yet reached only the mere fringe of telephony, as will be fully seen when ultimate development has been reached.

SOME FOREIGN THOMSON HUSTON WATER POWER PLANTS.—At St. Brieux, Cotes du Nord, France, two 1300-light Thomson-Houston alternators are driven by two Hercules turbines of the vertical type, one of 125-horse power, and the other of 150-horse power. An interesting characteristic of this plant is, that the two alternators are run in multiple upon the same circuits. The distance from the central station to the center of distribution is 8.4 miles, and the pressure employed is 2000 volts. It is interesting to note that the wire employed to convey the current for 2600 16 candle power incandescent lamps 8.4 miles is in this case only .31 inch in diameter. At Guatemala, Central America, a combined arc and incandescent plant has been operated by means of water power since 1887. A part of the plant, consisting of two A-70 1300-light alternators, is 3½ miles distant from the city. The dynamos are driven by a countershaft from the 21-inch Rodney Hunt turbine of 250-horse power. Three 18-light arc dynamos are 7½ miles away from the city. The city of Puebla, Mexico, possesses an electric lighting plant which is in many ways remarkable. Two hundred arc lamps of 1200-candle power are run by four 50-light arc dynamos, in a station about 13 miles from the center of the town, where the river Atoyac furnishes power for a 200-horse power Leffel double turbine. Each of the four circuits is about 26 miles in length, and consists of a No. 4 insulated wire. The dam and all the masonry connected with the station itself is built of fine cut stone, forming, probably, one of the most substantial and best built structures in Mexico. As the station is so far from the town, and in the midst of a country infested with bandits, the Government finds it necessary to maintain at all times a guard, consisting of seven soldiers, to protect the station from injury by marauders.

ELECTRICAL APPLIANCES appear to be rapidly extending in every direction and for the most varied purposes.

A contract has been entered into between the Niagara Power Co. and an electric company in Buffalo, by which the latter will utilize 20,000-horse power, which will be distributed throughout the city of Buffalo, for all ordinary power purposes.

The rapid transit commission of New York has completed its labors and presented its report. The engineer of the commission expresses the belief that electricity will be the power adopted, although it is not expressly specified in the report.

An immense electric plant is to be placed in position at the Peorran mine in Burke, Montana. Seven carloads of machinery are already on the ground, at last reports, and two more loads will be required to complete the plant. All power in connection with the immense works will be supplied by it. One of the dynamos is 225-horse power, the largest west of the Mississippi river. They will have 450-horse power, 225-horse power now operating their concentrator, hoist, etc. Daniel Thiery is in charge of the work, assisted by that able electrician, Harry Goodwin. The power to operate this plant is supplied by water, a fall of 760 feet, or 430 pound pressure, being secured.

The Morgan mine of Nevada is to have a 50-light accumulator plant, to be supplied by the Pacific Electric Storage Co. of this city.

There are now orders out for a large number of Electric lighting plants in this city.

OBJECTIONS TO ELECTRIC MOTORS IN COLLIERIES.—Prof. S. P. Thompson states that there are two points to which colliery managers are likely to raise objections in the use of electric motors in pits. The first of these is the possibility of gas explosion being caused by a spark occurring at the commutator of the motor where the electric current is conveyed into and out of the rotating armature by means of the brushes. The second is the use, in the pit, of driving belts, which not only take up space, but cannot be kept in good working order in dirty and damp situations. The commutator difficulty is, he believes, largely an imaginary one. No doubt, in many dynamos and motors, a bright bluish spark may occasionally be observed at the tips of the brushes, especially if the latter are not in proper adjustment. In well designed machines of modern construction, the spark is practically non-existent under ordinary conditions of working. The question raised is whether it affords any real danger. The spark is so close to a large mass of copper that it is practically cool; so cool, indeed, that it is extremely difficult to cause it to ignite anything.

THE LARGEST ELECTRIC LOCOMOTIVE EVER BUILT is said to be the one now being used by the Lonsdale Co. at its extensive cotton mills in Lonsdale, R. I. It consists of a platform car and trucks having a 30 horse power motor, with a trolley stand at one end, and at each end controlling devices, so that the locomotive may be moved both forward and backward. The locomotive is capable of hauling 60,000 pounds, and goods may be also placed on the platform of the locomotive itself. The length of the track over which the machine runs is 2700 feet. Electricity is supplied from a 500-volt dynamo having a capacity of 30,000 volts, and this is operated by a water-wheel. This renders the cost of operation very inexpensive, while a large amount of time and energy is saved in shipping goods from one part of the establishment to another.

THE ELECTRIC LIGHT AN AID TO DENTISTRY. Dr. Prunyn, a dental authority of note, says that he finds that by electric light dentists can find imperfections in cavities prepared for filling, that escape notice under a different light. This is particularly the case with the form of decay known as the white decay. You may prepare the cavity with the ordinary care, having it perfectly dry, seemingly, a magnifier, even, showing you no imperfections, but with the aid of this pale, white, electric light, more intense than daylight, you will find imperfections.

PAPERS ON ELECTRICITY.—Mr. Geo. P. Low, an electrical expert of this city, has commenced a series of papers to be read before the members of the California Electrical Society. His first paper was on the "Hazards of Electric Light and Power Circuits," in which he entered upon a general discussion of the elementary principles involved. The papers will be continued at every regular meeting of the society.

ELECTRIC MOTORS are not in as general use in England as in this country on account of the low price of gas there. A horse power can be generated in London by a gas engine for less than two cents per hour, whereas electricity costs more than twice that amount.

THE ELECTRIC WELDING OF RAILWAY BARS has reached an ultimate and really practical success in regard to bars, switches and crossings. Moreover, the welding has been proven more uniform and stronger than can be reached by any other method.

The first electric telegraph at all deserving the name was invented by Messrs. Cooke and Wheatstone, and was laid on the London & Blackwell Railway in June, 1837.

USEFUL INFORMATION.

Wood Pulp.

Wood pulp is fast becoming an industry of large proportions. A contemporary says:

Wood fiber has come into general use as a substitute for cotton rags and other materials formerly employed in the making of paper. This fiber is called pulp, having taken the name which used to be given to the cotton and linen fiber when it had been prepared by maceration for spreading into sheets of paper. The wood fiber used to be prepared, only a few years ago, by a wholly mechanical process. The blocks of wood were ground or rasped off by action applied obliquely to the grain, the length of fiber dependent partly upon the angle at which the block was held during this process.

In place of the old mode of obtaining wood pulp, chemical treatment of the wood is now in vogue. As formerly, the bark is stripped from the wood to secure fiber of uniform quality. All discolored or decayed parts are removed for the same reason. Then the wood is cut across the grain into thin chips, which are carried to the top of the mill and dropped into large drums about 14 feet in diameter and 24 feet long.

The drums are made strong enough to bear a pressure of from 75 to 200 pounds to the square inch. When a drum is packed full of chips, it is filled with sulphuric acid and other chemicals. The wood is converted into a cotton-like product, which is then pressed dry and washed. It is next mixed with water, rolled flat and cut into shape for bundling. In this condition it is said to be made up of 60 per cent moisture and 40 per cent fiber. In this shape it goes to the paper mill. It is found to be better to pay the freight on the contained water than to cheapen the cost of transportation by pressing out the water, for the pulp packs hard when it is dry.

One cord of spruce wood is estimated to make 1200 pounds of dry fiber, worth from \$1 to \$1.50 a hundred pounds. A sulphite plant that will use up from 8 to 15 cords of wood every 24 hours costs about \$10,000.

EVOLUTION OF THE KNIFE.—"This case full of implements which we have newly placed on exhibition is designed to show the development of the tool which we call the knife, beginning with the earliest times," said Prof. Meson at the National Museum to a Washington Star reporter. "First, you observe, is the fragment of flint which the savage split by banging it on top with a stone hammer into a number of flakes. The smaller ones were used for arrow points and the larger ones for knives, their edges being split off so sharp that you might almost shave with some of them. Next you see the flint flake inserted into a handle of split-wood or bone, and as further improvements, the fastening of this primitive knife in the handle by the resin of trees and by cord of one sort or another bound around to secure it. The most beautiful knife in the collection is the exquisitely molded blade of greenish shade belonging to the stone age, handled with a walrus tusk. You can hardly find a more admirably formed weapon among the best products of modern toolery wares. Most curious of the modern tools here is the sailor's knife, square at the end instead of pointed, to prevent stabbing in a row or the dangerous falling of the weapon from aloft. Its blade drops out at the end of the handle when a catch is touched, so that Jack can hold a rope with one hand and open the knife for service without the need of ten fingers."

INCREASING USE OF COPPER.—At present, the American Bell Telephone Co. of Boston has under way 50 lines of long-distance telephone construction from Chicago to New York. Each of these 50 lines takes two lines of wire, making 100 lines of single wire, and as the distance from New York to Chicago is about 980 miles, the length of wire used in connecting these two points would be 98,000 miles of wire. The size of the copper wire used in the construction of the long-distance telephone weighs 174 pounds to the mile, making the total weight of copper turned into wire for this one undertaking 17,052,000 pounds, or 8526 tons; or 3,000,000 pounds more than the total production of the Tamarack for the last year; or within about 1,800,000 pounds of the combined output of the Quincy, Osceola and Franklin, or, omitting the Calumet and Hecla, Tamarack and Quincy, more copper than the remaining combined Lake Superior copper mines produced in 1890.—*Mining Gazette.*

A GOOD HORSESHOER IS BORN, NOT MADE.—"Nay, lad, I'll have a great patience with you. Before many days are over, make the shoe you may, and make it well; but to shoe a horse as the horse ought to be shod, that comes by God's grace."—*George MacDonald.*

A **BLOTTER** can be made that will remove ink spots from paper. Take a thick blotting paper and steep it several times in a solution of oxalic acid or oxalate of potassium. While the ink spot is still moist apply the prepared blotter, and the ink will be entirely removed.

A **DOCUMENT** envelope that works like a telescope, adjusting itself to one paper or to fifty, is a recent invention.

GOOD HEALTH.

GLUE IN SURGERY.—In some of the surgical clinics in Germany, there is now employed a glue for holding dressings in place—designed to be used in all those cases where elastic collodion and solutions of rubber are found so convenient, especially in holding dressings over fractures, while at the same time permitting free motion of the parts. It has the advantage of not cracking or breaking, of holding firmly, of being very pliable, allowing a great amount of motion, and, lastly, of not preventing the exercise of the function of the skin over which it is placed, so that there does not occur any peeling off of the upper layers of epithelium with a tendency to eczema. This glue is composed of glycerine, gelatine and water, of each 30 parts, and 10 parts of oxide of zinc, this making what is known as the thick paste; the thin paste has 30 parts glycerine, 20 parts gelatine, 40 parts water and 10 parts zinc oxide; the mixing of these elements is of course done over heat, and the paste is liquefied over a water bath when needed. When ready to apply, the part is well dried with a brush, a ring made round the part to be enclosed, and the gaze of the dressing then laid on, care being taken to have the pieces cut large enough to allow the edges to extend into the ring of paste already laid on. Over this is placed a single or double layer of gauzes, cut somewhat larger; the whole is now painted over with the paste, and the dressing is finally dabbed over with a hunch of cotton held in the hand.

CORNS NEED ABSOLUTE REST.—An absolute and permanent remedy for corns is the rest cure, says a New York Times writer. If you can go into a fortnight's seclusion giving out that your ankle is sprained, and keep the corn foot in a stocking and wool bedside slipper, without pressure, and using only when walking about the room, the corns will disappear and will not return. All inflammation subsides first and the corn becomes loose and easily detached, and that is the end of it. For soft corns the constant wearing of a bit of old linen saturated every morning with sweet oil is said to be a sure cure. From the beginning the pain of the inflammation ceases, and after a time the corn itself loosens and falls out. Both these remedies are from good authority and will bear trial, the first one, perhaps, being rather difficult of accomplishment, since many of the acids and corn salves sold, irritate and produce soreness and the knife of the chiro-podist is apt to afford merely temporary relief.

CURIOUS CASE OF COLOR BLINDNESS.—The London *Lancet* publishes a curious case of color blindness. The patient was an engine driver in Russia, about 40 years of age, whose vision was perfect until 1889. Then he began to suffer from violent headaches, due to over exertion and insufficient sleep, which were followed by a loss of all power to distinguish colors. Everything appeared to him to be red, and he was obliged to throw up his position. Dr. M. Reich, who examined him, could discover no disease, but found his sight, focus and sensation of light, normal. In May, 1890, the man again submitted himself for examination, declaring that his sense of color had been restored. This proved to be the fact. The *Lancet* thinks that "this case seems to show that sensation of color is perfectly independent of physiological function."

CRAMP IN THE LEG.—Many persons of both sexes are greatly troubled with cramps in one or both of their legs. It comes on suddenly, and is very severe. Most people jump out of bed—it nearly always comes on just after going to bed or while undressing—and ask some one to rub the leg. There is nothing easier than to overcome the spasm. Provide a good, strong cord—a long garter will do if nothing else is handy. When the cramp comes on take the cord, wind it round the leg over the place that is cramped, and take an end in each hand and give it a sharp pull—one that will hurt a little. The cramp will instantly cease, and the sufferer can go to bed assured that it will not come again that night.

MENTHOL OR SALICYLLATE OF SODA.—Menthol is strongly recommended to relieve itching of whatever nature it may be. It has the greatest effect in cases where scratching provokes soreness. This is said to be particularly true of nettle rash, certain eczemas, and the pruritus following scabies, if the itchy mites have been destroyed. The experience of the writer is to the effect that a solution of salicyllate of soda is the best remedy for the above-named troubles. Either are good and their virtues should be more generally known.

ASTHMA. It is stated, may be greatly relieved by soaking blotting or tissue paper in strong saltpeter water; dry it, then burn it at night in the sleeping-room.

MIND AND MATTER.—"What is mind?" asked an inquirer of a scientific friend. "No matter," was the laconic answer. "What is matter?" continued the questioner. "Never mind," replied his scientific friend.

CALIFORNIA VINEYARDS.—One of the telegraphic rumors is that an Englishman is now on the way to buy up the vineyards of California.



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SAN FRANCISCO:

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Business Announcements.

[NEW THIS ISSUE.]

Delinquent Sale Notice—Gray Eagle Mining Company. Situation in Mine Wanted—W. M. Dividend Notice—Pacific Coast Borax Company. Assessors—Wade & Wade, Los Angeles.

See Advertising Columns.

Passing Events.

The proceedings of the miners' convention at Auburn, Placer county, published in another column of the PRESS, shows that at least the miners have made up their minds to permanently organize and bring their many grievances to the attention of the public.

A state miners' convention has been called for Jan. 20th, when representatives from all the counties of the State are expected to meet, in order to bring to the attention of Congress the condition of the mining industry in this State, and the measures required to put it on a proper basis.

The revelations in the case of the Hale and Norcross, just now on trial in this city, shows a very bad state of affairs in connection with Comstock mining interests. A new deal in management all round would be a very good thing for that section.

The fact that capital is seeking investment in the hydraulic mines of Siskiyou county (as shown in our Mining Summary) indicates that the Legislature was wise in permitting the miners to use the Klamath river for their tailings. That section of the State will doubtless reap permanent benefit from the mining operations.

The Miners' Convention at Auburn.

On Saturday last, pursuant to call, the miners of Placer county met at Auburn to organize a permanent miners' association, and issue a call for a State Convention to take place in San Francisco, January 20th. A very earnest body of practical miners came together at this meeting, and the proceedings were of a temperate, conservative character, while at the same time it was evident that all were anxious in presenting the true condition of the mining industry of this State to the public.

The Hon. J. H. Neff of Colfax presided, and Committees on Credentials, Order of Business, Permanent Organization and Resolutions were appointed. A recess being taken, to give them time to report. On reassembling, the Committee on Permanent Organization and Order of Business, through Wm. Nichols, Jr., reported: Hon. J. H. Neff of Colfax for chairman; John Spaulding of Auburn, T. B. Harper of Lincoln and H. V. Martin of Towles for vice-chairmen; Hon. J. A. Fischer, secretary, T. B. Everett, Cor. secretary; W. W. Rodenhaver, Fin. secretary.

The Committee on Resolutions being called on, reported through its Chairman, Hon. J. A. Filcher, as follows:

WHEREAS, The apparent conflict of interest between the mining and agricultural industries of California, in reference to the subject of hydraulic mining, has resulted in the confiscation of property rights and of the almost total annihilation of a great industry on the one hand, and in "hard times," financial stagnation and bankruptcy on the other, and

Whereas, A conflict, which can only result in disaster to both of these interests, may be adjusted by a wise and conservative harmonizing of the interests affected; and

Whereas, The Governor of the State of California has called attention to the great importance of the solution of the mining problem; and

Whereas, By a complete restoration of the gold industry of California, the gold output of the State and the revenue of the country would be increased from ten to twelve millions of dollars a year, according to the length of the rainy season; and

Whereas, It is shown by competent Government engineers, after a thorough investigation of the mining situation, that it is practicable to construct such restraining dams in the mountain canyons as would hold back the debris from all the available mining ground in the State, and at a cost trifling in amount compared to the gold contained in such mining ground, and that by the construction of such dams mining of all kinds could be continued without injury to any other industry; and

Whereas, The decision of the Supreme Court of the United States and the rulings of the Department of the Interior have been adverse to the mining industry, the rule of the Court being calculated to turn over much valuable mining ground to the corporations when it decides that "the exception of mineral lands from grants by acts of Congress shall be considered to apply only to such lands as were at the time of the grant known to be valuable for their minerals," and the decisions of the Department being calculated to defeat the miner from procuring patent to his claim, wherein it rules that "the miner must show that the lands he is claiming possess a known, present, actual value for mining purposes;" and

Whereas, In the face of these facts the miners have remained inactive, believing in the justice of their cause and trusting that the Government would see their wrongs and redress them; and

Whereas, Instead of remedial measures being proposed they seem to feel the hands tightening around them; and

Whereas, They are convinced that further indifference to these growing evils, means the complete ruin of the miners' property and death to the mining industry; therefore be it

Resolved, That further indifference is dangerous—that the time has come for action—and to the end that the truth may be known and justice done, and that the mining industry, so essential to our State's prosperity, may be fully revived on a basis that will result in benefit to all and harm to none, we call upon every citizen of California to join in the agitation of such measures as will restore our rights and open the way for us to extract from Nature's storehouse the buried treasure that will enrich us, give employment to thousands of our fellow-men, and infuse new life into every industry in California.

Resolved, That a State Miners' Convention be called to meet in San Francisco, at some date in the near future, and we recommend that this Convention, now assembled, issue the call for said State Convention, appoint the delegates thereto, and instruct as to how they shall be elected.

Resolved, That said State Convention be requested to memorialize our Senators and Representatives in Congress to make sufficient appropriations for the construction of restraining dams for the impounding of mining debris, as recommended by the Board of Government Engineers.

Resolved, That said State Convention be also requested to memorialize our Senators and Representatives in Congress to secure such modification of the mining laws as will prevent the Interior Department from practically nullifying the intent of Congress in enacting them.

Resolved, By the miners of Placer county in convention assembled, that said State Convention be also requested to urge our Senators and Representatives in Congress to use every honorable means in their power as such Senators and Representatives, to secure a sufficient appropriation from the General Government to thoroughly dredge and otherwise improve the Sacramento, San Joaquin and Feather rivers, and to maintain the same in such improved condition.

Resolved, That coupled with the clause of the River and Harbor bill containing such proposed appropriation, we demand the insertion of a provision declaring that in consideration of such appropriation, and liberal appropriation on the part of the General Government for the improvement of such streams, and for the maintenance of work thereon, the right to conduct any or all classes of mining upon the tributaries thereof, shall thereafter be deemed lawful and shall not be subject to legal dispute.

Resolved, That it is the sense of the Miners' Convention that no general public property is a speedy and amicable settlement of this question, a settlement whereby the rights and interests of the miner and the farmer shall each be protected, and whereby millions of new money may be annually thrown into circulation among the people.

J. A. FISCHER,
 W. B. THORPE,
 ALLEN TOWLE,
 G. H. COLBY,
 FRANK SANDERS,
 Committee.

The reading of the above resolutions was frequently interrupted by applause, and at the

conclusion of the reading a motion to adopt the report as read was carried enthusiastically.

This completing the order of business as laid down, it was suggested that the convention proceed to issue a call for a State Miners' Convention. Acting on this suggestion, W. B. Thorpe moved that the chair appoint a committee of five to prepare and present for consideration a call for the State Convention. The motion was carried, and the chair appointed W. B. Thorpe, Allen Towle, Wm. Grinnell, W. D. Perkins and J. A. Filcher.

On the suggestion of Mr. Kennedy of Lincoln, the names of C. G. Yale (of the MINING AND SCIENTIFIC PRESS) of San Francisco, T. C. Hooking of Grass Valley, O. L. Cain of Placerville and H. A. McCrany of Lakeport were added to the committee.

Pending the report of the Committee, a motion was made by Hon. J. B. Patterson and carried, that the Convention resolve itself into "The Placer County Miners' Association," and that the officers of the Convention be the officers of the association for the first year, and that the members of the Convention be members of the association, and that all other miners of the county be requested to join the association at once by sending in their names and the initiation fee of \$1 to the Secretary.

On motion of R. L. Dunn, the chair was requested to appoint a committee of five from the Convention, and two at large, to draft an address to the people of the State for the purpose of more particularly attracting attention to the mining situation and stimulating interest in the same. The chair appointed as such committee R. L. Dunn, Dr. M. Schnabel, John M. Fullweiler, Hon. G. H. Colby and J. B. Hobson. At large, C. G. Yale of San Francisco, and Hon. J. A. Filcher of Auburn. On motion, the Chairman of the Convention, Hon. J. H. Neff, was added to said committee. Subsequently, on motion, the names of Hon. N. Martin of Dutch Flat, Judge D. W. Spear of Auburn, and Judge Amos Stevens of Colfax, were also added to said committee.

A permanent Finance Committee of the Association were appointed as follows: J. B. Hobson, Dr. M. Schnabel and J. C. Boggs.

D. W. Lubeck was appointed Treasurer of the association.

On motion, the following were named as a standing Executive Committee, with full power to promulgate the call and make all necessary arrangements for the Miners' State Convention, viz.: Hon. J. H. Neff, O. G. Yale, J. B. Hobson, B. F. Hartley and John Spaulding.

Subsequently T. B. Everett was elected Secretary of the Executive Committee.

We are unable, from lack of space, to give the names of all the delegates to the County Convention, or those appointed to the State Convention, but will do so next week. The call for the State Convention will be found elsewhere in this issue of the PRESS.

FEATHER RIVER GOLD.—General Secretary Edward Hauey and Managing Director J. S. G. Kirkpatrick of the Gold & Feather Channel Mining Company and the Golden Gate Alluvium syndicate (of which Frank McLaughlin of Oroville is general manager) have recently come from London, and have been making an inspection of the mine. About 145 men are at work at the mines, but thus far little gold has been procured.

THE JANIN PROCESS.—A dispatch from the Comstock, dated Dec. 2, says: The Janin brothers, who came here to try a process of reducing Comstock ore, which, it was claimed, would save a much larger percentage of the assay value than the process now in operation in Carson river mills, have returned to San Francisco and report that the test was a failure.

WORLD'S FAIR.—The California State Commissioners have passed resolutions as follows: That the commission out of the fund appropriated by the State (1) erect a State building and collect a State exhibit to be contained therein; (2) aid meritorious exhibits in the discretion of the commission to enter into competition in the different departments.

CALIFORNIA TIN.—Press dispatches state that the Temescal tin mines are now turning out three to four tons of pig tin per day. The new concentrators and ore-breakers that have been brought from England, at an expense of \$67,000, are in full working order, and the force of miners and laborers has been increased by 30 men.

THE LAST OF THE FRENCH COPPER SYNDICATE.—The factories, plant and good-will of the Societe des Metaux were sold at auction at Paris this week for \$3,600,010. This finishes up the famous French copper syndicate, which made a failure of cornering the copper product of the world.

The San Francisco Gaslight Co. is about to erect, at its works at North Beach, the largest gas-holder in America.

Comstock Milling Methods.

The suit of M. W. Fox against the directors of the Hale & Norcross Mining Co., which was continued over by Judge Hebbard from November 25th to the 30th, came up on Monday. The increased attendance of both miners and attorneys shows that interest increases in the suit, owing to the startling developments made as to the peculiar methods in vogue in the milling of Comstock ore.

The greater part of Monday morning was consumed in a legal fight over the admission of the books and records of the mine in evidence, owing to the strenuous objection of the defense; but the court admitting them, the examination of Clayton Belknap, secretary at Virginia City of the Hale & Norcross, was the first thing in order. By Mr. Belknap it was shown through the books that an aggregate of 88,887 tons of ore sent from the Hale & Norcross to the Nevada and Mexicon mills from December, 1887, to June, 1890, inclusive, of which about 75 per cent was sent to the Nevada mill, in which W. S. Hohart and Alvinze Hayward testified they owned each a two-fifths interest, and one-eighth of the remaining one-fifth is owned by Evan Williams, the superintendent. According to the record, the 88,887 tons of ore assayed from \$25.15 up to \$72.12 per ton, giving a total assay value of \$3,505,361.37, of which the mills only returned \$1,826,873.80. Attorney Baggett introduced 58 exhibits of car-sample assays taken at the mine during the months of December, 1888 and 1889, by which it appeared, particularly for December, 1889, that large quantities of low-grade ore were sent to the mill, which, the plaintiff claims, was for the purpose of bringing down a high average and enabling the mill company to mill ore at \$7 per ton. For instance, it is charged that in a great number of cases, cars assaying as low as \$8.50 per ton were sent to the mills which "pulped" about 60 per cent of the car samples and from which about 70 per cent of the battery sample was obtained. In other words, \$3.50 rock pulped about \$5, and there was obtained from this pulp 70 per cent, or about \$3.50, which cost \$7 to mill.

In the cross-examination of Mr. Belknap, he stated that the way he ascertained whether the mill was returning the proper amount of bullion was by comparing the amount of bullion which the mill notified him they were about to ship, with the pulp assay, and if the amount of bullion was equal to 70 per cent of the pulp assay, he thought everything was all right. When Attorney Baggett quoted from the report for March, 1890, when the mill assay was \$31.01 and the mill assay \$19.10, and the mill returned 35 per cent of the mill assay, and then asked, "Were you satisfied with 70 per cent of the battery assay of 35 per cent?" the witness hesitated in his answer, but finally said that the mill was interrupted and the flume broken, which brought out the following question, "Was the bullion carried off on the broken flume?" but to which the witness did not respond.

On Tuesday morning, Alonzo C. Hamilton, superintendent of seven Comstock mines, was placed on the witness-stand and testified that he was a director of the Hale & Norcross mine from March, 1887, until a year later. He had received notice from San Francisco that he was elected a director, but never attended any meeting or paid any special attention to Hale & Norcross affairs. He saw Chollar and Hale & Norcross assays made, both car-sample and pulp assays. He had noticed a great difference between the car-sample and pulp assays, but did not say anything about it. He owned an eighth interest in the Nevada mill, but which did not cost him anything. He stated that he had not received any dividends from his interest in the Nevada mill, and also said that the mill had bought stock for him, but how much he was unable to say. This stock he did not pay for, but supposed Mr. Hayward did. The stock, he thought, Mr. Hayward either has or it is in some broker's hand.

The afternoon was taken up with the examination of Evan Williams. He was questioned with reference to an unstamped bar of bullion, weighing 218 ounces, of which, it appeared, the books made no mention. He said he knew nothing about the bar, and could not say whether or not it had ever been deposited in the bank. Mr. Williams stated that he might have deposited bullion in the Mint at Carson in the night time, but he did not know any of the Mint watchmen. He testified that he had paid several thousand dollars to H. M. Levy, president of the Hale & Norcross Mining Company, and that he received the money from W. S. Hohart. He did not know why the money was paid to Levy. "You will not admit," asked

Mr. Baggett, "that the money was paid to Mr. Levy to keep him from complaining of you in reference to the manner in which you milled the Hale & Norcross ore?" The witness answered that he knew nothing about the matter. For the year 1890, down to July 9th, beyond which the inquiry could not extend, five checks were drawn, aggregating \$7821.60, payment on which, it is claimed, was made to Levy as his share for assistance in the manipulation of Hale & Norcross millions. Mr. Williams' examination for the day ended with an explanation in detail of the manner in which ore was milled at the Nevada mill while he was superintendent there.

The examination of Mr. Williams was resumed on Wednesday. According to the *Chronicle's* published proceedings of the case, the morning session of court was technical and therefore dry. Mr. Williams gave considerable technical testimony relative to the milling of ores at the Nevada and Mexican mills, of which he was superintendent. The interesting fact was developed that the Mexican had a little annex of its own, but it has only two pans grinding out sulphurets and concentrates. The manner of taking pulp assays by tank shovel-

The Stahl-Rew Amalgamator.

From the report of the Secretary of Mines for Victoria (Australia) we reproduce parts of the Stahl-Rew amalgamating pan. The patent includes both center and outside feed, to be used as an alternate method of feed and discharge, as may be preferred. If the outside feed is used, the inner circle of sheet iron is taken out, the allmes, tallugs, etc., fed in at the top, between the outer casing of sheet iron or cast iron and the inner casing of the same class of iron, the rubber and iron ring on the miller making a perfectly water-tight joint, compelling the slimes to be drawn under the grinding surfaces, and by the centrifugal motion, brought in direct contact and swirled about in the mercury well under the false bottoms, thereby insuring perfect amalgamation. After grinding and amalgamation, the debris passes up through the central hole of shoes and miller into the body of the pan and brought in

side feed. The central feed renders the rubber joint unnecessary. With the save-all and shower-box, it is of no consequence if the mercury should flow as in other pans. It will be collected by being sprayed down on the floating plate, the residue collected in the basin by being continually rolled over and over by the copper-lined bracketed muller.

In the inventors' experiments, they have found that all the fine flour gold is lost through its extreme fineness and the want of suitable appliances to insure amalgamation. Assays made by Mr. Rew for a number of years showed that gold is lost in dirty water at the rate of 1 grain for each 300 gallons of water used in treating ores, and in many instances from 1 to 8 dwts. per ton of ore.

By reference to the cuts, the construction of the plan will be readily understood: A, inside of pan, to contain slimes after being ground and amalgamated, passing away by the overflow shoot at A1; a, inner circle of sheet

I, vessel for generating hydrogen gas from muriatic acid, zinc and ammoniac chloride, for keeping mercury bright, giving it the power to disperse the air film surrounding particles of gold, thereby insuring perfect amalgamation; i, pipe for conveying hydrogen gas to mercury; ii, regulating tap.

J, valve to allow of alternate feed, center or outside; J1, perforated shower-plate, drop 14 inches.

K1, save-all complete, intended to revolve slowly over a bed of mercury, whereby all floored mercury or fine amalgam may be collected if any escape the floating plate, and collect any mercury that by accident or otherwise may pass through other receptacles; K, revolving disc or muller, carrying on the underside 24 amalgamated copper-lined pine battens, with spaces of three quarters inch in between each batten. This disc is for rubbing the tail waste into the mercury below. A corrugated copper disc can be used if preferred; k, bed of mercury; k1, head of driver and central feed hopper, the feed falling from shoot on to perforated iron plate, for equal distribution on to mercury.

L, collecting tub for cleaning up and collecting mercury and amalgam; l, discharge pipes from various mercury wells to central cleaning-up tub.

A Miners' State Convention.

About all the prominent industries of the State have permanent organizations except that of mining. Representatives of these industries meet and discuss their needs, and some attention is paid them. The miners, however, have not heretofore banded together for mutual support and defense. Had they done so before, the industry in this State would have been in better condition than it is to-day. There are many things unknown to the general public, which tend to depress our mining industry. Gradually the area open to the prospector is being narrowed by unjust, if not illegal, practices. The rulings of the Departments are such as to nullify the Acts of Congress and practically change the laws. It is almost impossible to obtain patent to mineral land. Other classes of claimants are favored as against the miners. The hydraulic mining question requires unbiased examination and judgment in order that injustice shall not be done.

These and other things need to be discussed. The miners are the men who originally settled this State, but of late they have been ignored and these miners injured by misrepresentation and neglect. The time has come for them to speak. They will therefore organize and bring themselves and their grievances to the attention of the people of this State, and Congress. Placer county has been the first to move and her citizens now call upon miners in other counties to assist in rehabilitating the gold and silver mining industry of California.

At the Placer County Miners Convention last week, a committee was appointed to prepare a call to the miners of California, and this has been issued. It is as follows:

The miners of Placer county, in convention assembled, hereby issue a call for a Miners' State Convention, to meet in San Francisco on Wednesday, the 20th day of January, 1892, at 2 o'clock P. M.

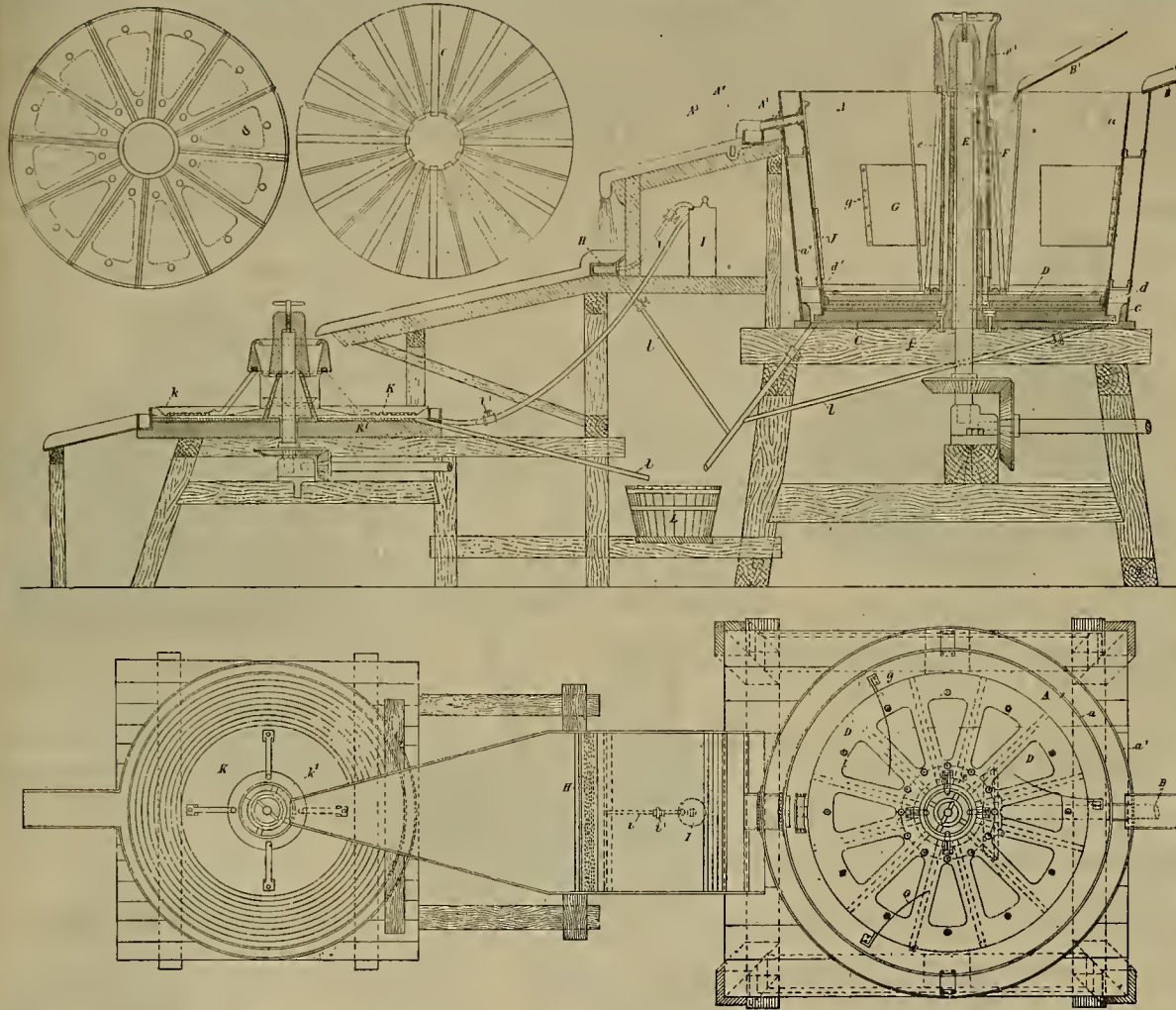
The apportionment of delegates to said Miners' State Convention shall be thirty (30) from each county in California, except San Francisco, which shall be entitled to sixty (60) delegates.

Said delegates shall be elected by a convention of miners and mining sympathizers, called to meet in each county on or before the first day of January, 1892, for that purpose. Any three or more miners may issue the call for said County Convention.

If, however, in any county in the State, the miners fail to meet and elect delegates, as herein provided, on or before the 1st day of January, 1892, then the Supervisors may, and they are hereby requested to appoint the delegates which their respective counties are entitled to in said State Convention; provided, that no man who is unfriendly to the mining interests shall be eligible to a seat in said convention, and where the Supervisors may appoint such delegates, they are requested to discriminate in favor of mining men.

W. B. THORPE, Ch.,
ALLAN TOWLE,
J. A. FILCHER,
WM. GRINNELL,
W. D. PERKINS,
J. B. HOESON,
P. McHALE,
T. C. HOCKING, of Nevada Co.
C. G. VALE, of San Francisco.
C. L. CAIN, of El Dorado,
H. A. McCRAVEY, of Lake.

COAL RECEIPTS.—For the month of November, 1891 546 tons of coal came to this port. Of this, Puget Sound sent 31,294 tons, Oregon 2570, and the balance was foreign; 42,119 tons came from British Columbia. Thus far this year we have received 1,427,789 tons of coal, of which Puget Sound sent 374,722 tons.



STAHL-REW PATENT GRINDING AND AMALGAMATING PAN FOR SAVING FINE GOLD AND MERCURY.

ers was identical at both mills. The samples were taken by the foreman under the general direction of the witness to take correct samples. He described the Archimedeal screw which raised the material from the agitator on to the coarse blankets, through which, with the use of water, it settled into the tanks and was carried back to the sand floor and goes into the amalgamating pans.

At the close of the morning session, Mr. Williams was served with a summons making him a party defendant in the suit as the representative of the Nevada M. and M. Co., of which Mr. Williams, A. Hayward and W. S. Hohart are the principals.

In the afternoon Attorney Baggett interrogated the witness at length on redirect examination with a view of showing that in the milling of the Hale and Norcross ore at the Nevada mill it was possible to produce millions without any record of it being kept. The witness was in general charge of the mill, but much was entrusted to the watchmen, foremen and clerks in the mill. The witness lived at Empire, about 10 miles from the Nevada mill, and he usually visited the mill two or three times a week. Referring to the value of tallings from the Hale and Norcross ore, worked at the Nevada mill, the witness said the total value was \$14,800. When asked how he had secured those figures, as he had previously stated that there was no record of the value of tallings, he replied that he obtained the figures from the milling company, and presumed they were correct. The remainder of the testimony was unimportant.

contact with amalgamated or electro-silvered copper plates, thence to the discharge, over an electro-silvered plate; from this plate into a perforated plate, with holes one-sixteenth of an inch diameter, and showered down by a fall of 11 inches on to a slip of amalgamated copper plate floating on a bed of mercury, the debris passing from this into the center of a slowly revolving bracketed muller, with the under side of brackets lined with amalgamated copper revolving in a basin three-fourths inch deep, containing a bed of mercury from one-fourth to one-half inch deep. The mercury in this basin and under the floating plate of shower box is kept in good working order by hydrogen gas generated by scrap zinc, muriatic acid and chloride of ammonia, and injected into the mercury from the generator, through flexible tubes. By this means floored mercury is recovered.

When the central feed is used, all that is required is to put on the inner circle, marked No. 3, take out the rubber joint and the top malleable iron ring of muller, turn the feed into the central space, the debris passing down under the shoe and between the false bottoms, ground, amalgamated and discharged at the periphery into the body of the pan, and undergoing the same process as described for the out-

iron; a1, outer circle, of either cast or sheet iron, of pan. The space of four inches between the two circles of iron marked a2 is used for introducing the feed direct under the muller shoes and mercury-well; A2, distributing-box, five feet long; A3, pine mercury-well, with pine check-board.

B, outer feed shoot; B1, inner feed shoot.

C, main cast-iron bottom, in four segments; c, false bottoms (12 pieces).

D, muller; d, rubber, three-fourths inch square; d1, iron liner, three inches deep by three-eighths inch thick; on the face of this liner, the rubber presses to make water-tight joint, thereby insuring the feed passing under and between the grinding surface, passing into body of pan through the center hole.

E, three-inch vertical driving shaft; e, driving or muller arm; e1, head of driver.

F, sleeve or column, containing brasses at top for vertical shaft; f, counter-sunk bolts by which center column of sleeve is bolted down to main bottom.

G, amalgamated copper or electro-silvered copper-plated wings; g, angle-iron ribs for fastening wings to.

H, amalgamated copper plate, floating on bed of mercury, to receive shower of tail waste of pan; h, mercury; h1, mercury-well.

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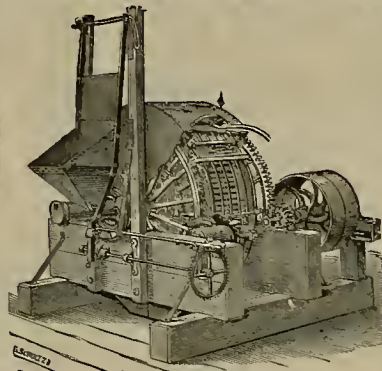
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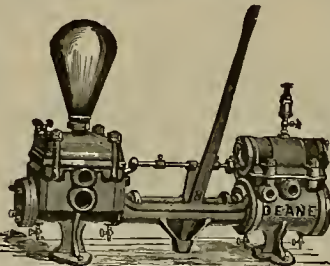
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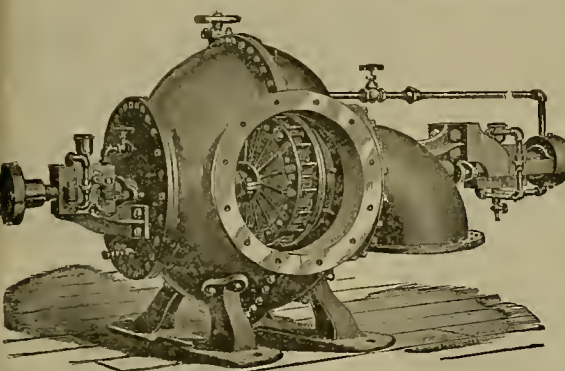
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 3, 1891.

As usual, the last month of the year witnesses a dull market in all branches of trade. Rains are wanted in all parts of the State for both mining and agricultural purposes. With heavy rainfalls in the valleys and deep deposits of snow on the mountain ranges, a prosperous season in 1892 is assured. Among iron-workers, an undue degree of activity for the time of year is reported. Many firms are taking advantage of present low prices ruling for raw materials, by buying and storing for future use. The local money market continues easy, and no friction is now looked for, even during the time when the usual demands are made in this month on call borrowers.

Eastern advances are confirmatory that all kinds of business will enter 1892 in a more prosperous condition than ever before known, which condition will hold the greater part of, if not throughout the year. Mr. Depew outlined it when he said, at the Chamber of Commerce banquet at New York: "There is to be a famine of cars, a famine of locomotives, a famine of the methods by which this enormous product which the fields of the country have produced may be conveyed to the sea, and so go abroad where it is needed." These conditions, he said, are going to make railroads more than usually prosperous in their net earnings; are going to lead to the construction of new lines of railway; are going to make a demand for iron, coal and coke. Making due allowance for flowers of rhetoric, the prophecy, there is reason to believe, will be literally verified. The gross amount of railroad earnings for September shows a gain of \$4,500,000 as compared with the same month last year, and the net increase was 10.32 per cent.

QUICKSILVER—Receipts the past week aggregate 560 flasks. The combination bought the past week the largest producing mine in Napa county. The market is steady at pool quotations.

MEXICAN DOLLARS—The market is slow at around 74½ cts.

SILVER—The market hangs around at prices current the preceding week. The Mint is in the market for its December quota, 4,500,000 ounces, but the buying has not made any perceptible effect on the market. The shutting down of the mines in the Candelaria district, Nevada, is offset through increased milling by the Tascara mines. Some action is expected to be taken at an early day by Congress looking to passing a free coinage bill.

LIME—Receipts the past week aggregate 7076 bbls., of which 2000 bbls. came from Oregon. The market is unchanged.

BORAX—Receipts aggregate 444 cts. The market is steady at combination quotations.

ANTIMONY—The market is quiet but firm.

LEAD—Last week 3000 pigs were shipped by water to New York. The market is barely steady. The East reports small supplies and smelters indifferent sellers. Buyers only take as required to meet their most urgent requirements.

TIN—The market is heavy and dull. Eastern advances report that several heavy blocks have changed hands, but still the market hung heavy. London advances, are more favorable to tin holders, yet if tin-plate makers curtail their output, the consumption will fall off.

IRON—The market is steady and firm. English advances report stronger views for shipment, due largely to higher freight rates. Eastern mail advances report a soft market, with concessions offered to buyers for delivery in the forepart of 1892.

COPPER—The market is hard to report satisfactory. Iron Age says of the New York market: On the part of the representatives of the leading producers, a certain degree of indifference is assumed and the principal consumers, it would appear, are equally as indifferent. Digging below the surface, however, some evidence of the disposition to get together at about 10 cents for deliveries running through the first quarter of next year is discovered, and the indications are that a liberal-sized deal will be effected at that price. For casting brands the nominal price is 10½ cts., but both the demand and the supply available for early delivery are so slight that other than purely "nominal" prices cannot be arrived at. In some instances, Arizona ingot has been delivered on contracts for ordinary casting stock, owing to inability to secure the latter, and it is not likely that the cheaper article will be more plentiful for some little time to come.

COAL—Imports the past week aggregate as follows: Seattle, 2660 tons; Newcastle, N. S. W., 4037; Carmelo Bay, 200; Departure Bay, 5337; Cardiff, 6037; Swansea, 3207; Liverpool, 146; Nainaimo, 2000; total, 23,981 tons. For spot and near-by cargoes the market is heavy, but for shipment or just shipped there is a strong tone. The declining freight market with us causes higher outward freights to us. The consumption with us continues free.

Eastern Metal Markets.

By Telegraph.

New York, December 2.—The following are the closing prices the past week:

	Silver	Copper	Lead	Tin
Thursday	43 9-16	94 1/2	11 10	4 30
Friday	43 9-16	94 1/2	11 10	4 30
Saturday	43 9-16	94 1/2	11 10	4 30
Monday	43 9-16	94 1/2	11 10	4 30
Tuesday	43 9-16	94 1/2	11 10	4 30
Wednesday	43 9-16	94 1/2	11 10	4 30

Copper shows more activity at lower prices. Lead is barely steady. Tin continues to shade. Borax is steady, as is quicksilver.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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COMPANY AND LOCATION.	No. AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Cons M Co, Nevada.....	7.....	Nov 4, Dec 9, Dec 23.....	Nov 4, Dec 9, Dec 23.....	C E Elliott, 309 Montgomery
Best & Belcher M Co, Nevada.....	13.....	Sept 22, Nov 5, Dec 9.....	Sept 22, Nov 5, Dec 9.....	H D Walker, 309 Montgomery
Bodie Cons M Co, California.....	7.....	Oct 28, Dec 4, Dec 31.....	Oct 28, Dec 4, Dec 31.....	L Osborn, 309 Montgomery
California Verde Marble Co, California.....	1.....	Nov 4, Dec 7, Dec 23.....	Nov 4, Dec 7, Dec 23.....	W J Gurnett, 309 Pine
Chollar M Co, Nevada.....	31.....	Oct 25, Nov 30, Dec 22.....	Oct 25, Nov 30, Dec 22.....	O E Elliott, 309 Montgomery
Confidence Silver M Co, Nevada.....	18.....	Nov 17, Dec 22, Jan 1.....	Nov 17, Dec 22, Jan 1.....	A S Croth, 414 California
Cons Imperial M Co, Nevada.....	32.....	Nov 5, Dec 8, Dec 23.....	Nov 5, Dec 8, Dec 23.....	C L McCoy, 331 Pine
Crow Point M Co, Nevada.....	55.....	Dec 2, Jan 6, Dec 23.....	Dec 2, Jan 6, Dec 23.....	J Newlands, 331 Pine
Eureka Cons Drift M Co, California.....	4.....	Oct 25, Nov 30, Dec 21.....	Oct 25, Nov 30, Dec 21.....	D M Kent, 330 Pine
East Best & Belcher Silver M Co, Nevada.....	7.....	Oct 22, Nov 24, Dec 12.....	Oct 22, Nov 24, Dec 12.....	C H Mason, 331 Montgomery
Fall River Cons Gold Quartz M Co, California.....	5.....	Oct 20, Nov 28, Dec 21.....	Oct 20, Nov 28, Dec 21.....	L Cassel, 115 Front
Gray Eagle M Co, California.....	25.....	Oct 27, Nov 30, Dec 21.....	Oct 27, Nov 30, Dec 21.....	A W Barrows, 303 California
Hale & Norcross S M Co, Nevada.....	99.....	Oct 16, Nov 24, Dec 15.....	Oct 16, Nov 24, Dec 15.....	A B Thompson, 309 Montgomery
Head Centre and Tranquility M Co, Arizona.....	3.....	Nov 12, Dec 15, Jan 1.....	Nov 12, Dec 15, Jan 1.....	J W Pew, 310 Pine
Horse Shoe Bar Cons M Co, California.....	3.....	Oct 30, Dec 1, Dec 22.....	Oct 30, Dec 1, Dec 22.....	D M Kent, 330 Pine
Kentuck Cons M Co, Nevada.....	2.....	Oct 25, Dec 1, Dec 23.....	Oct 25, Dec 1, Dec 23.....	J W Pew, 310 Pine
Morgan M Co, California.....	15.....	Nov 20, Dec 23, Jan 20.....	Nov 20, Dec 23, Jan 20.....	L O Brees, 230 Montgomery
Occidental Cons M Co, Nevada.....	8.....	Oct 19, Nov 24, Dec 15.....	Oct 19, Nov 24, Dec 15.....	A K Durhrow, 309 Montgomery
Peer M Co, Arizona.....	1.....	Oct 13, Nov 23, Dec 21.....	Oct 13, Nov 23, Dec 21.....	N T Messer, 309 Montgomery
Piedmont Cons M Co, Calif. & Ariz.....	1.....	Nov 5, Dec 8, Dec 23.....	Nov 5, Dec 8, Dec 23.....	W Seitz, Forest City
Sage M Co, Nevada.....	77.....	Oct 13, Nov 15, Dec 17.....	Oct 13, Nov 15, Dec 17.....	E B Holmes, 309 Montgomery
Seg Belcher & Mides Cons M Co, Nevada.....	9.....	Oct 13, Nov 15, Dec 17.....	Oct 13, Nov 15, Dec 17.....	E B Holmes, 309 Montgomery
Silverado M Co, California.....	2.....	Nov 12, Dec 15, Jan 5.....	Nov 12, Dec 15, Jan 5.....	S E Cox, Chronicle Building
Silver Hill M Co, Nevada.....	2.....	Dec 1, Jan 4, Jan 22.....	Dec 1, Jan 4, Jan 22.....	A Chemist, 328 Montgomery
Terrace M Co, California.....	6.....	Oct 16, Nov 24, Dec 13.....	Oct 16, Nov 24, Dec 13.....	A H Fish, 309 Montgomery
Utah Cons M Co, Nevada.....	13.....	Oct 16, Nov 24, Dec 13.....	Oct 16, Nov 24, Dec 13.....	A H Fish, 309 Montgomery

MEETINGS TO BE HELD.

COMPANY AND LOCATION.	MEETING.	SECRETARY.	DATE.
Andes M Co, Nevada.....	Annual.....	J W Twigg, 309 Montgomery.....	Dec 18
Gould & Curry S M Co, Nevada.....	Annual.....	A K Durhrow, 309 Montgomery.....	Dec 21
Ke-tuck Cons M Co, Nevada.....	Annual.....	J W Pew, 310 Pine.....	Dec 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Obampion M Co.....	50.....	T West, 320 Sacramento.....	Aug 15
Cons Cal & Virginia Co, Nevada.....	30.....	A W Haves, 309 Montgomery.....	Aug 17
Copits M Co.....	30.....	E M Hall, 314 Montgomery.....	Sept 10
Eureka Cons M Co, Nevada.....	25.....	101 Sansome St.....	Dec 3
Great Western Quicksilver M Co.....	30.....	A Halsey, 328 Montgomery.....	Oct 1
Idaho M Co, California.....	30.....	Nov 12, Dec 15, Jan 5.....	Aug 10
Magdalen Gravel M Co, California.....	30.....	D M Kent, 330 Pine.....	Aug 20
Pacific Coast Borax Co, California.....	100.....	A H Clough, 230 Montgomery.....	Dec 10
Standard Cons M Co, California.....	10.....	J W Pew, 310 Pine.....	Oct 25

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING NOV. 12.	WEEK ENDING NOV. 19.	WEEK ENDING NOV. 26.	WEEK ENDING DEC. 3.
Alpha.....	30.....	45.....	65.....	45.....
Alta.....	20.....	7.....	30.....	150.....
Belcher.....	1.05.....	1.60.....	1.45.....	1.95.....
Belle Isle.....	30.....	35.....	40.....	40.....
Best & Belcher.....	1.05.....	1.85.....	1.50.....	1.70.....
Bullion.....	50.....	70.....	50.....	65.....
Bodie Cons.....	50.....	70.....	50.....	65.....
Bulwer.....	15.....	15.....	20.....	25.....
Commonwealth.....	15.....	15.....	20.....	25.....
Cons Cal & Cal.....	4.70.....	5.05.....	5.04.....	5.....
Challenge.....	75.....	100.....	1.45.....	1.10.....
Chollar.....	100.....	95.....	130.....	1.25.....
Confidence.....	2.40.....	3.00.....	3.50.....	2.25.....
Cons Imperial.....	45.....	10.....	10.....	45.....
Caledonia.....	35.....	40.....	45.....	35.....
Crown Point.....	95.....	1.45.....	1.60.....	1.85.....
Crocker.....	10.....	10.....	15.....	10.....
Del Monte.....	30.....	30.....	35.....	30.....
Eureka Cons.....	35.....	55.....	55.....	40.....
Excelsior.....	15.....	15.....	20.....	15.....
Grand Prize.....	1.35.....	1.55.....	1.45.....	1.60.....
Gould & Curry.....	1.30.....	1.15.....	1.50.....	1.50.....
Hale & Norcross.....	30.....	50.....	50.....	55.....
Idaho.....	30.....	50.....	50.....	55.....
Justice.....	15.....	15.....	20.....	25.....
Kentuck.....	15.....	20.....	20.....	15.....
Lady Wash.....	15.....	20.....	20.....	15.....
Mono.....	2.00.....	2.45.....	2.15.....	2.45.....
Mexican.....	2.00.....	2.45.....	2.15.....	2.45.....
Narajo.....	10.....	10.....	20.....	20.....
North Belle Isle.....	10.....	10.....	20.....	20.....
Nev. Queen.....	35.....	40.....	45.....	30.....
Occidental.....	2.95.....	3.50.....	3.30.....	3.55.....
Ophir.....	1.10.....	1.55.....	1.30.....	1.50.....
Overman.....	1.45.....	2.00.....	2.40.....	1.95.....
Potosi.....	15.....	15.....	15.....	15.....
Peerless.....	15.....	15.....	15.....	15.....
Piedmont.....	1.30.....	1.60.....	1.40.....	1.55.....
Sage.....	1.30.....	1.60.....	1.40.....	1.55.....
S. B. & M.....	35.....	50.....	50.....	45.....
Sierra Nevada.....	1.35.....	2.50.....	2.70.....	2.75.....
Silver Hill.....	15.....	20.....	20.....	15.....
Scorpion.....	15.....	20.....	20.....	15.....
Union Cons.....	1.85.....	2.25.....	2.30.....	2.10.....
Utah.....	35.....	40.....	40.....	35.....
Yellow Jacket.....	1.30.....	1.60.....	1.40.....	1.55.....

San Francisco Metal and Coal Market.

THURSDAY, December 3, 1891.		STEEL.	
Per lb.....	15 1/2	English, lb.....	16 @ 20
Refined, in car lots.....	8 @	Clanton tool.....	9 @
Powdered, do.....	8 @	P. P. Diamond.....	4 @ 10
Concentrated, do.....	7 1/2 @	Pick & Hammer.....	8 @ 10
All grades jobbing at advance.		Machinery.....	4 @ 5
COPPER.		Toe Calk.....	4 1/2 @
Bol.....	42 @	TIN PLATE.	
Sheathing.....	22 @	B. V. steel grade.....	5 25 @
Ingot, jobbing.....	15 @	Charcoal, 14x20.....	6 00 @
Do, wholesale.....	14 @	Do roofing, 14x20.....	6 00 @
Fire Box Sheet.....	22 @	Do, do, 20x28.....	12 00 @
IRON.		COAL.	
Bar, base.....	3 @	Irregular, nominal.....	21 @
Norway, base.....	42 @	SPECIALTY.	
PIO IRON.		SPECIALTY.	
Eglinton 3/4 ton.....	25 00 @	Wellington.....	8 00 @
Glenariff.....	25 00 @	Gretta.....	8 00 @
Am. Soft, No. 1.....	25 00 @	Carbon Hill.....	8 00 @
Oregon Pig.....	25 00 @	Nanaimo.....	7 50 @
Puget Sound.....	25 00 @	Gilman.....	7 00 @
Clay Lane White.....	25 00 @	Seaside.....	7 00 @
Shotts, No. 1.....	25 00 @	Coos Bay.....	6 00 @
Langholm.....	25 00 @	Channel.....	9 50 @
Thorncliffe.....	25 00 @	Egg hard.....	14 00 @
Gartsherrrie.....	25 00 @	Cumberland, in sacks.....	11 00 @
Barrow.....	25 00 @	Do, hulk.....	9 00 @
Carboheat.....	23 00 @	Wall end.....	9 00 @
CHROME IRON ORE.		Scotch Splint.....	8 00 @
Per ton.....	10 00 @	Brynno.....	8 50 @
LEAD.		West Hartley.....	8 00 @
Pig.....	45 @	TO LOAD PER TON.	
Bar.....	55 @	Australian.....	57 50 @
Sheet.....	75 @	Liverpool at am.....	7 50 @
Pipe.....	65 @	Cardiff.....	7 25 @
SHORT.		Lehigh Lump.....	13 00 @
(Discount 10¢ on 500 bags.)		Cumberland.....	9 50 @
Drop, 2 1/2 bag.....	2 10 @	Egg hard.....	12 00 @
Buck, 2 1/2 bag.....	2 10 @	West Hartley.....	8 50 @
Chilled, do.....	2 30 @	OOKE.	
QUICKSILVER.		English, to load.....	89 00 @
By the flask.....	47 50 @	Do, spot, in hulk.....	12 00 @
Flasks, old.....	10 @	Do, in sacks.....	14 00 @

Sales at San Francisco Stock Exchange.

THURSDAY, December 3, 9:30 A. M.	
400 Alpha Cons.....	30 @ 35c
700 Alta.....	50 @ 35c
300 Andes.....	75 @
350 Bodie Cons.....	40 @
300 Bells Id.....	40 @
175 Best & Belcher.....	2.05 @ 2.1
100 Bullion.....	1.25 @
250 California Verde.....	1.30 @
700 Chollar.....	1.30 @
300 Cons Cal & Va.....	34 @ 35
1350 Cons Imperial.....	10c
750 Crown Point.....	1.05 @ 1.1
650 Excelsior.....	1.15 @ 1.2
525 Gould & Curry.....	1.15 @ 1.2
350 Justice.....	45c
50 Kentuck.....	60c
100 Lady Washington.....	20c
100 Ophir.....	10c
150 Overman.....	10c
500 Peer.....	15 @ 20c
50 Peerless.....	15c
500 Silverado.....	1.40 @
200 Silver Hill.....	10c
400 Union Cons.....	1.75 @
200 Utah.....	55c
400 Yellow Jacket.....	1.35 @ 1.40

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY.—LOCATION OF principal place of business, San Francisco, California. Location of works, Placer county, California. Notice.—There is delinquent upon the following described stock, on account of Assessment (No. 26) levied on the 27th day of October, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Am't.
Jane A. Armstrong.....	105	\$ 4 20
J W Buffington, Trustee.....	522	1 04
W H Buffington, Trustee.....	612	1 10
O H Bogart, Trustee.....	447	5 00
O H Bogart, Trustee.....	448	1 00
O H Bogart, Trustee.....	449	1 00
O H Bogart, Trustee.....	450	1 00
O H Bogart, Trustee.....	451	1 00
O H Bogart, Trustee.....	452	1 00
O H Bogart, Trustee.....	453	1 00
O H Bogart, Trustee.....	473	2 14
O S Brown, Trustee.....	287	100
S E Brown, Trustee.....	312	50
S E Brown, Trustee.....	536	20
A W Barrows, Trustee.....	547	1 00
A W Barrows, Trustee.....	550	1 00
A W Barrows, Trustee.....	555	1 00
A W Barrows, Trustee.....	559	1 00
A W Barrows, Trustee.....	563	1 00
A W Barrows, Trustee.....	564	1 00
A W Barrows, Trustee.....	568	1 00
A W Barrows, Trustee.....	573	1 00
A W Barrows, Trustee.....	576	1 00
A W Barrows, Trustee.....	579	1 00
A W Barrows, Trustee.....	583	1 00
A W Barrows, Trustee.....	589	1 00
A W Barrows, Trustee.....	600	1 00
A W Barrows, Trustee.....	601	1 00
A W Barrows, Trustee.....	608	1 00
A W Barrows, Trustee.....	610	1 00
A W Barrows, Trustee.....	611	1 00
A W Barrows, Trustee.....	625	1 00
A W Barrows, Trustee.....	627	1 00
A W Barrows, Trustee.....	632	1 00

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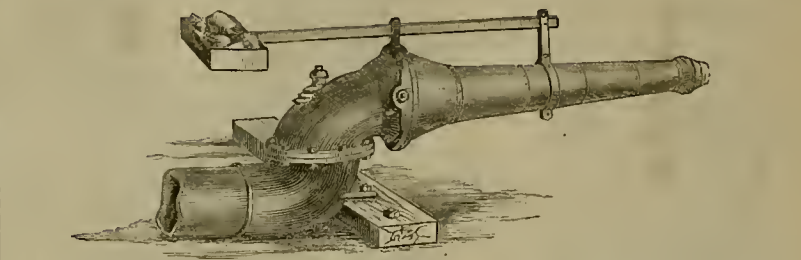
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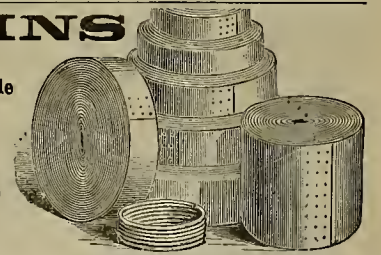
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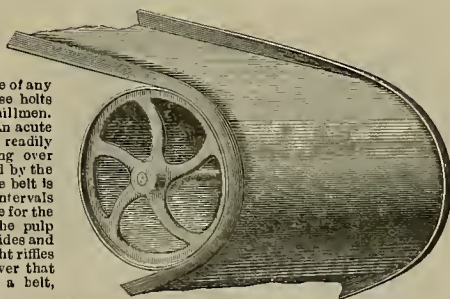
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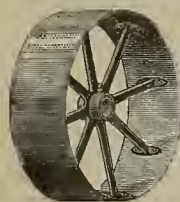
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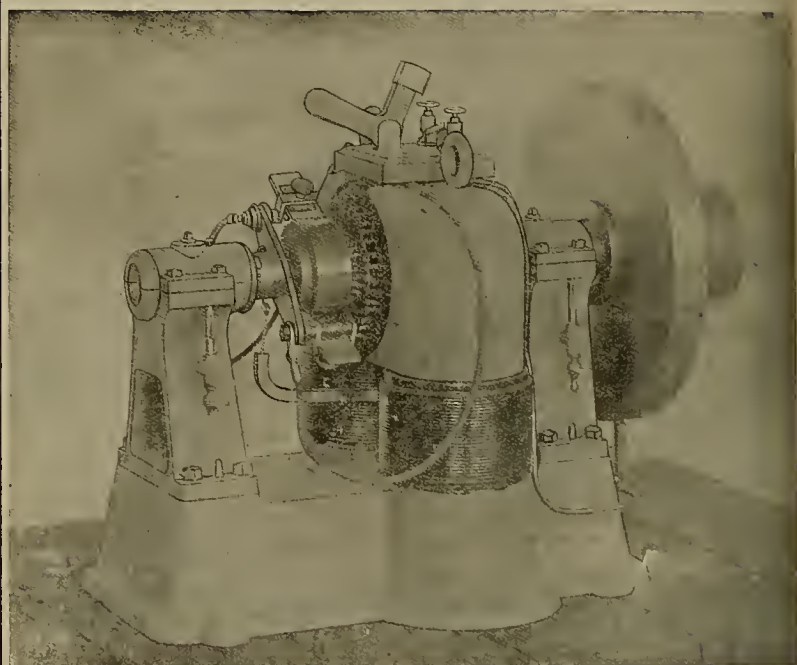
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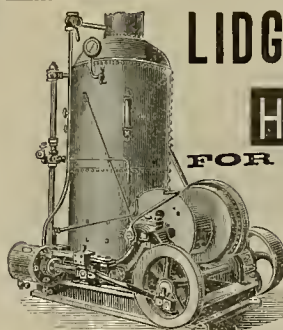
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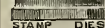
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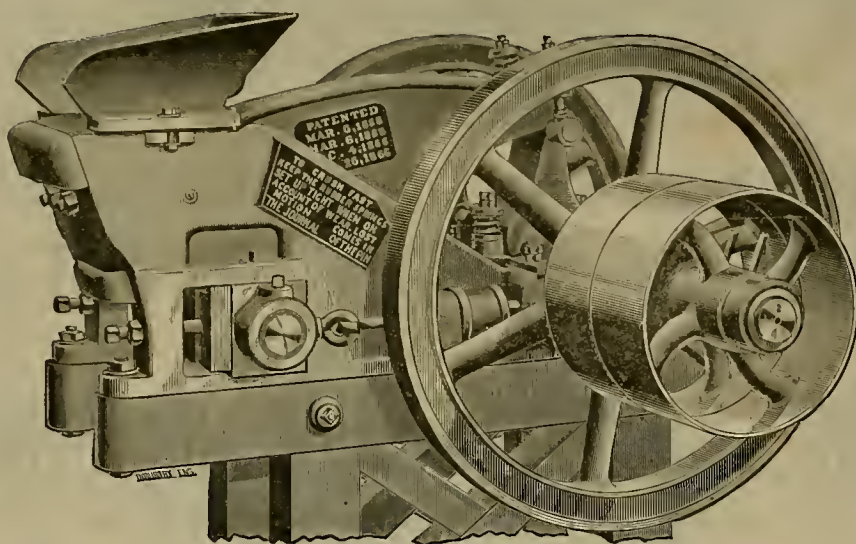
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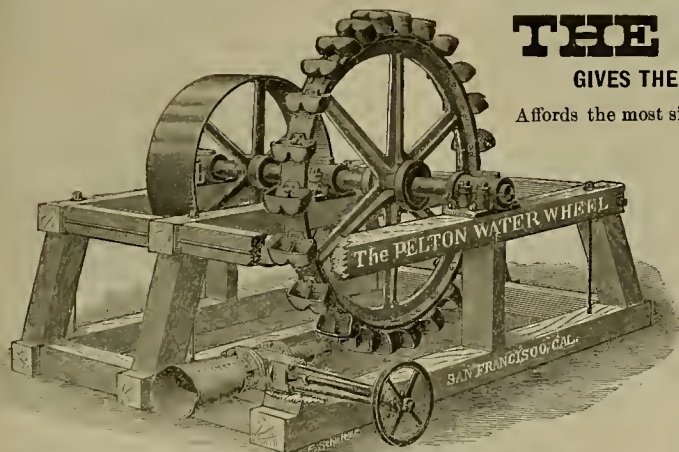
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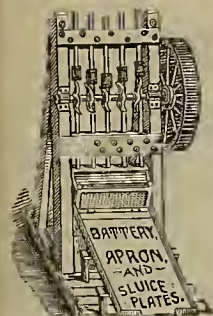
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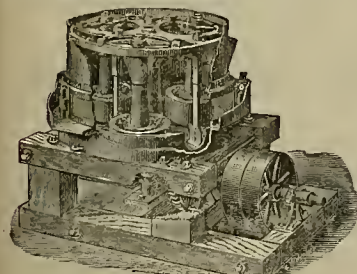
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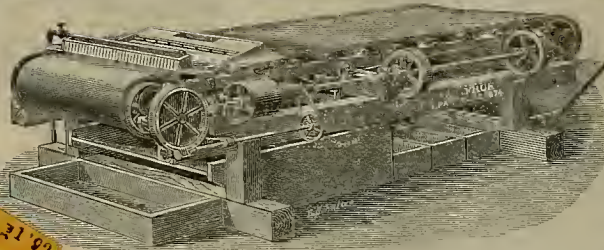
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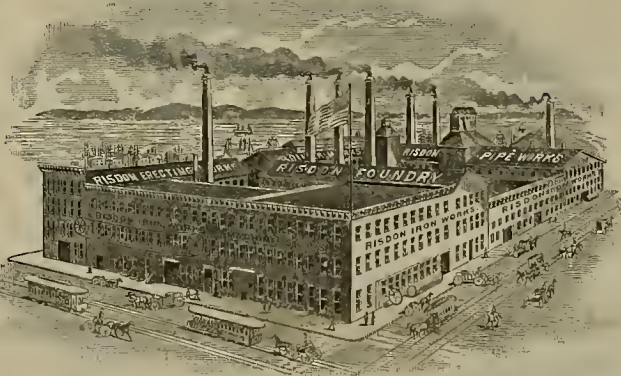
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VOL. LXIII.—Number 24.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 12, 1891.

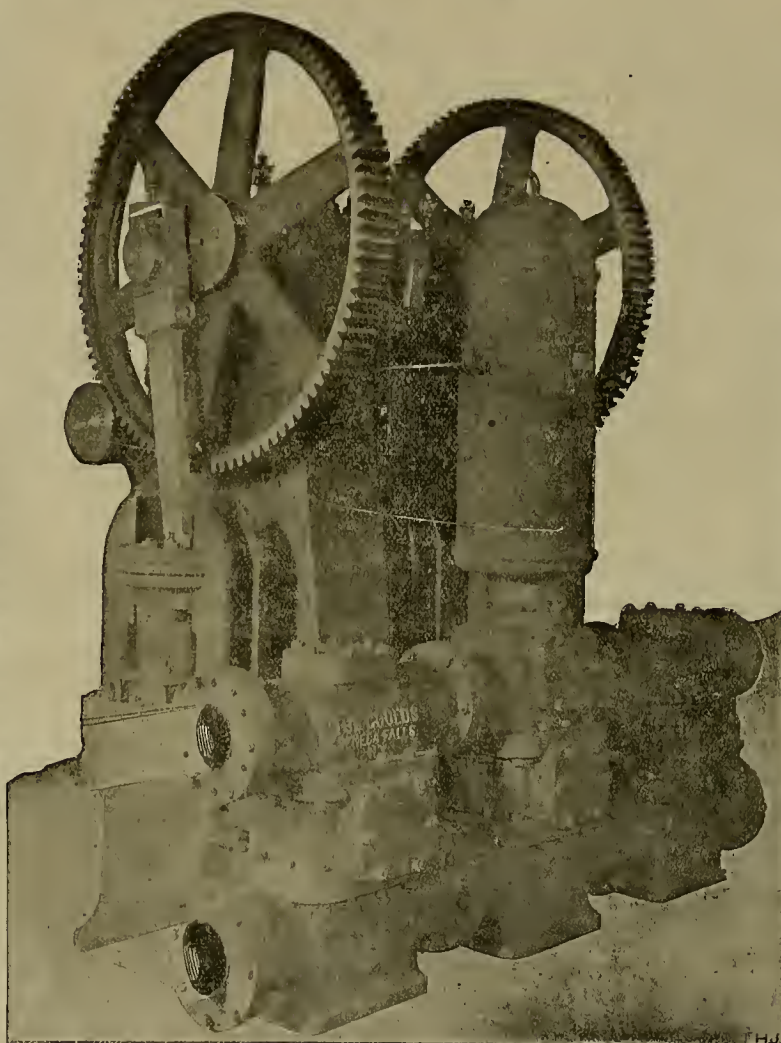
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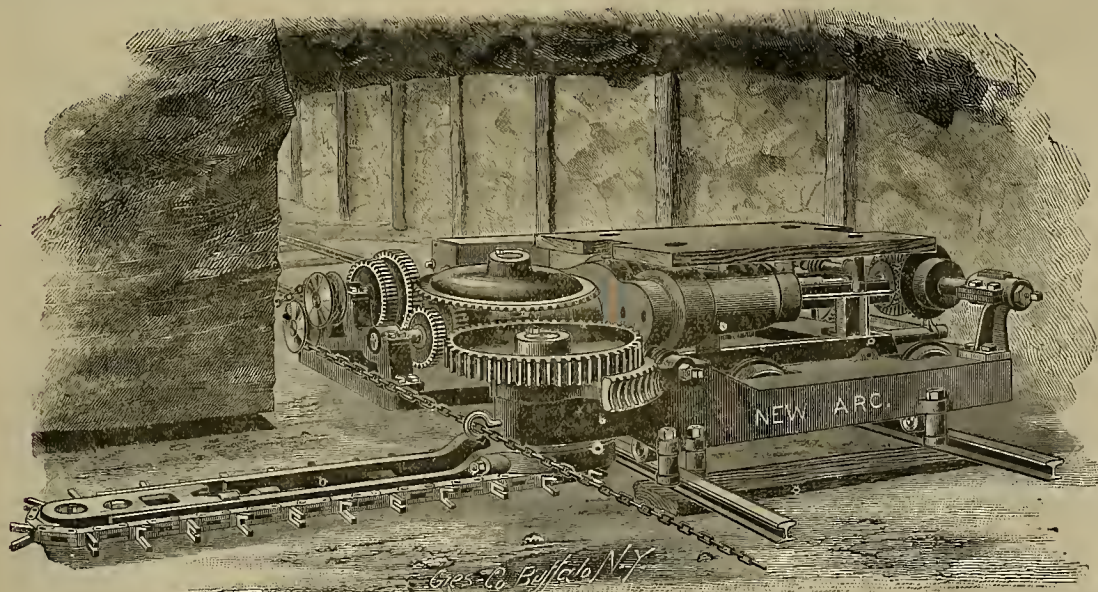
The undercutting of coal by machinery is an important problem for the mining fraternity. The undercut may be made by hand, but this method not only adds largely to the expense of mining coal, but also makes a large quantity of fine coal or slack, which is comparatively a waste product, except in certain cases. A successful machine not only cheapens production, but also increases output and insures the mining company, in a large measure, from delays and shut-downs. There are several types of machines on the market and in actual operation, but the one herewith illustrated works in an entirely different line from other machines.

The New Arc machine consists of the following parts: A heavy iron base cast in one piece serves as a foundation for all the parts, carrying two pairs of axles one at right angles with the other. The gauge of one pair is fixed to suit the regular track gauge of the mine wherein the cutter is to work, and these axles carry small flanged wheels upon which the cutter is easily moved about the mine and in and out of the rooms. The second pair of axles carry small wheels for supporting the cutter when in actual operation and carrying it along the face of the wall being cut. They are not flanged, but are kept upon the track by two pairs of single and two pairs of double guides, as shown in the illustration. The support of the machine is easily changed from one pair of axles to the other by means of a cam worked by screws, the larger flanged wheels being raised out of the way when the cutter is in actual operation, as shown in the illustration.

The motive power is furnished by a 15-H. P. motor, which in the latest machine is somewhat changed from that shown, the motor being perfectly water-tight and thoroughly protected from all danger of mechanical injury. The armature shaft carries a bevelled pinion at each end. That nearest the commutator is made to engage by means of a controlling lever, either one of the two bevelled gears shown in the illustration, thereby giving the shaft on the



LARGE-SIZED TRIPLEX ELECTRIC PUMP.



THE NEW ARC COAL UNDERCUTTING MACHINE.

right a right-handed or left-handed rotation. By means of the chain of gears and an ingenious mechanical device, this shaft operates the feed chain at practically any desired speed. The feed chain is made fast to a post ahead of the machine, and in this way the cutter is drawn forward at a speed under control of the operator, and which can be varied with the hardness of the coal. The same gearing, by means of another controlling lever, is made to move the arm from position alongside the machine at the beginning of the cut to the position shown in the illustration, where it is held rigidly during the remainder of the cut. The second pinion on the armature shaft operates the endless chain, carrying the cutting knives about the arm. The controlling devices are such that the cutter may be held stationary while the knives are in operation, an important point in drilling through particularly hard formations. The length of the arm carrying the endless chain is made to suit the requirements of the mine in which it is to operate, the undercut usually being made of a depth equal to the thickness of the vein.

The length of the arm is adjustable within certain limits, in order to take up the stretching of the chain due to wear. The chain and knives are drop-forged and of a strength to withstand the hardest usage. The knives are easily detachable from the chain, so that a new set of sharp knives may be substituted for the old set in a very short time. The track along the face of the work consists simply of two rails with an iron cross tie, and may be laid and removed in a very short time and with a small amount of labor. By the use of this track and this type of machine, necessity for moving a heavy piece of apparatus by hand oftentimes in a very low room is avoided, a very important point, as any one who has had experience in these matters can testify. For its operation the cutter requires two men, one of whom is at the machine itself controlling the rheostat and operating devices, and the other keeps the track laid ahead and sets the posts for anchoring the feed-chain. All trouble with the slack clogging up the cut is removed, as the knives themselves bring nearly all the slack outside the cut, leaving a clean space.

The machine is thus seen to possess very important advantages in all kinds of working, and for large rooms or a logg wall system, these advantages become all the more prominent. It is operated on a 220-volt current, making it entirely harmless electrically. The New Arc is handled by the Thompson-Ven Depoele Electric Mining Co., 620 Atlantic avenue, Boston, to whom should be addressed inquiries regarding it.

The Gould Electric Pump.

On this page is given a photo-engraving of the largest-size Gould triplex electric pump, designed to produce a discharge of constant velocity. The original power generating the electricity may be placed a long distance from the pump itself, which is very often a great convenience. This large pump is adapted for many purposes, and may be placed in situations not suited to an ordinary steam pump.

A MEETING of miners has been called in Nevada county to appoint delegates to attend the State Mining Convention in San Francisco, January 20th.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

La Plata, Utah.

EDITORS PRESS:—Having seen nothing recently in the columns of the MINING AND SCIENTIFIC PRESS relative to the camp of La Plata, Utah, doubtless it would be well to send you the following items relative thereto.

This mining camp is situated in a high plateau, 22 miles northeasterly from Ogden, Utah, and the first locations were made in August of the present year. The ores are argentiferous galenas, along with a very fine class of carbonate ores.

About ten days after the first discovery of galena at that place, the writer, accompanied by three others, quietly stole away from Ogden to investigate the newly discovered bonanza. Believing that we were about to be blessed in being allowed to get in on the ground floor of a new camp, we stole silently and quietly away from Ogden at midnight. Taking up through Ogden canyon, we passed the primitive granite formation that forms the base rock of the great Wasatch range of Central Utah. Passing on up the canyon, where a roaring river shouts out the human voice, we beheld what is a fine lesson in nature for the geologist. Succeeding each other in a vertical position, stand a hundred mighty strata of lime, slate, sedimentary sandstone and quartzite, until the canyon is passed, and a low range of mountains is reached beyond Ogden valley.

This range of low mountains is made up entirely of slate, lime and quartzite, in which a very good class of galena ore has been found from time to time by the Mormon herders during the last 30 years, but up to the past summer, no attention of the outer world was given to the region.

It was after a hard ride that we halted beyond the head waters of the Middle Fork of Ogden river, and found the newly discovered prospects of silver-bearing lead ores.

At that time there were but three locations, namely, the Sundown, the La Plata and the Dead Rat. They were owned by stockmen, who, excited by the bright galena ore, imagined that they were the possessors of boundless wealth.

As the galena cropped in great masses from the surface, it was evident that an immense deposit of mineral would be taken from the district and in the Sundown mine we found lying up against the galena a stratum of very good cuprite copper ore running as high as 83 per cent in copper.

The formation we found to be entirely of dolomite lime flanked to the eastward by a quartzite formation, and in this formation of lime to the width of about three miles lead and copper ores abound running high in these metals, but very low in gold or silver.

The region is a high and beautiful plateau, well wooded and well watered, easy of access via the Middle Fork of Ogden river from Ogden; being thus near to railroads there is no doubt but that next summer will see a thrifty mining camp at La Plata. At present the chief mines there are the Red Jacket, the Sage Hen, La Plata, Sunrise, Sundown, Last Dollar, Last Lime, the Warleigh, Queen of the Hills and Moonlight in each of these there is a good showing of either carbonate or galena.

In the Red Jacket a clearing 70 feet long and eight feet wide has been made entirely in ore, which although an ore that is low in silver, yet, as it runs from 60 to 80 per cent in lead, it will like the others be truly a bonanza to its owners.

The country in which these mines exist is mineral bearing over a large extent. An area of 900 square miles lies open to the willing prospector, and at present about 300 souls dwell at La Plata.

The country is easy of access, wood and water are plentiful and the necessities of life are cheaply procured from ranchmen in the valleys below. From 31 assays taken of the ores of La Plata, we found lead to run to an average of 60 per cent and silver \$5.83 per ton. The cheapness with which ores of this class may now be worked in Utah and Colorado warrants us in believing that La Plata is destined to become one of the great lead-producing camps of the Pacific Coast.

DON MAGUIRE.

Ogden, Utah, Dec. 2, 1891.

Record Your Mining Work.

There is a law, passed by the last California Legislature, of especial interest to miners, but of which many miners, no doubt, are ignorant. It is entitled "An Act Entitled an Act Relating to the Working Rights of Way, Easements and Drainage of Mines in the State of California," and will be found on page 219 of the Statutes of 1891. The portion of especial interest reads as follows:

SECTION 1. Whenever any mine-owner, company or corporation shall have performed the labor and made the improvements required by law for the location and ownership of mining claims or lodes, such owner, company or corporation shall file or cause to be filed, within thirty days after the time limited for performing such labor or making such improvements, an affidavit with the County Recorder of Deeds of the county in which the mine or claim is situated, particularly describing the labor performed and improvements made, and the value thereof,

which affidavit shall be prima facie evidence of the facts therein stated. Upon the failure of any claimant or mine-owner to comply with the conditions of this Act in the performance of labor, or making of improvements upon any claim, mine or mining ground, the claim or mine upon which such failure occurred shall be opened to relocation in the same manner as if no location of the same had ever been made. But, if, previous to relocation, the original locators, their heirs, assigns or legal representatives, resume work upon such claim, and continue the same with reasonable diligence until the required amount of labor has been performed or improvements made, and the required statement of accounts and affidavits filed with the County Recorder, then the claim shall not be subject to relocation because of previous failure to file accounts.

The balance of the Act is mainly a repetition of the United States Statute which provides how the required work shall be done by the owners, and which explains the proceedings necessary to forfeit the interests of such owners as fail to perform their share of the work.

One of California's Miners.

There died at Wright's Sanitarium, near San Jacinto, San Diego county, Nov. 7th, Pharez Allen Clark, a gentleman whom many miners and others of Northern California will well remember. Born in Illinois in 1845, removed to Iowa, from whence in 1860, in company with his parents, they started westward across the plains by means of ox-team prairie schooners, landing in California in that year. He had a natural aptitude for mining and also became an expert assayer and metallurgist. The famous silver excitement in the Santa Rosa district of Alpine county was his first field of operations, where he was soon made Recorder of the mining district, as also being made a postmaster and holding various offices of trust in that county. Although a large man physically, six feet six inches tall and weighing 350 pounds, he suffered continually from ill-health, and from the rugged wild haunts of Alpine he drifted to various mining sections in the northern part of the State, finally locating in Los Angeles county in 1872, and shortly after was largely instrumental in developing the Silverado mining district in Orange county, where he was also Recorder, Justice of the Peace and postmaster; but as is too often the case, the mines did not prove of sufficient worth to warrant the investment of large capital and were abandoned. From there he went to San Jacinto and engaged in farming, starting a nursery in Diamond Valley and building him a beautiful home.

In December, 1886, he married an estimable Los Angeles woman, two children being born to them, one only now surviving. His unstinted hospitality, proverbial popularity and genial qualities, will cause him to be remembered long years hence by many a miner who, hungry and homeless, asked only to receive abundantly at his door, where the latch-string always hung upon the outside. He built up mining camps and "grub-staked" the occupants, endeavoring to develop the mineral resources of our State, and while his reward was only the consciousness of helping his fellow-man, some of our mines and miners owe him more than a debt of gratitude.

TEMESCAL TIN.—A dispatch from Pomona, says: Several weeks ago Congressman Bowers of this district fortified himself for his going to Congress, where the McKinley bill would be discussed almost daily, with an abundance of facts and particulars concerning the tin-mining industry in the Temescal mountains, and spent several weeks in visiting the mines and watching the operations of getting out ore and producing the block tin. He had published, at his own expense, 1000 pamphlets descriptive of the Temescal tin mines, the extent of the operations there and the plans and preparations the tin company has made for developing its magnificent property. These pamphlets are designed for distribution among inquiring and interested members of Congress, and are designed to answer every possible question on the subject of producing block tin in Southern California that a free-trader or opponent of the tin clause in the McKinley bill can ask. Congressman Bowers has also prepared for himself 500 small bricks of Temescal tin, and will distribute the bricks among the members of Congress. Each brick has the words "Temescal, California" stamped upon it. Mr. Bowers is now the only member of Congress representing a district where tin ore is mined and smelted.

DANIEL CARPENTER, one of the best-known mining men of Montana, dropped dead at Great Falls on the 4th inst. Mr. Carpenter was a brother of the late Senator Matt Carpenter of Wisconsin. He was an old-timer in Montana, having gone there about 20 years ago. He was the first man to discover silver in the Nehart district, which he made, locating on Carpenter creek, which is called after him.

MINING DIVIDENDS.—During November, 30 mining companies in the United States, which make public statements of their earnings, paid dividends to the amount of \$1,442,275, against \$1,421,875 in October. The total for the first eleven months of the year is \$15,519,871. This amount is far in excess of that paid in the same time in 1890, the total for the latter year being but \$13,743,478.

A Rock-Drilling Contest.

A match of this kind occurred at Denver, Colo., on Nov. 19, 20 and 21, 1891. It was quite a notable event to the miners of Colorado, and excited much simulation. Several counties sent their best men, and some enthusiastic superintendents allowed men their time, and in some cases even expenses. Several hundred miners came to Denver to the trial, and large bets were made on the results.

The rules were three-fourths inch steel, and not over four-pound hammers for single-hand work, and seven-eighths inch steel, and not over eight-pound hammers for double-hand work. Miners to furnish their own tools. Time of drilling was to be exactly 15 minutes. All holes were down holes. The rock selected was a very hard, compact variety of (Gunnison) Colorado granite.

The following prizes were offered by the Mining Congress managers:

FOR DOUBLE-HANDED DRILLING.	
First prize.....	\$500
Second prize.....	400
Third prize.....	300
Fourth prize.....	200
Fifth prize.....	100

FOR SINGLE-HANDED DRILLING.	
First prize.....	\$300
Second prize.....	200
Third prize.....	150
Fourth prize.....	100
Fifth prize.....	50

Special Prizes.

For Best Single-Hand Drilling—Solid silver cup, presented by Judeon Dynamite & Powder Company.

For Best Double-Hand Drilling—Silver sledge and pick, presented by Taylor & Rathvon.

For Second Best Single-Hand Drilling—\$500 insurance paid up for one year, \$10 a week indemnity, presented by Equitable Accident Insurance Co.

For Third Best Single-Hand Drilling—\$500 insurance paid up for one year, \$7.50 a week indemnity, presented by Equitable Accident Insurance Co.

The drilling took place in the evening by electric light, before an audience of at least 2000. All entries, excepting one, were from State of Colorado. Following is full list and score:

DOUBLE DRILLING.	
Page and Reagan, Butte City.....	15-16
Kennedy and Rinker, Leadville.....	21 12-16
Lindgreist and Fanner, San Juan.....	28 10-16
Mullins and Oates, Gilpin.....	28 2-16
Harrington and Mann, Aspen.....	26 4-16
O'Keefe and Dwyer, Leadville.....	25 8-16
Short and Manuel, Gilpin.....	25
Abeard and Lyons, Leadville.....	24 15-16
McCarthy and O'Connell, Hinsdale county.....	24 10-16
Yates and Yates, Boulder.....	21 14-16
Griffin and Griffin, Clear Creek county.....	23 8-16
Hill and Cummings, Ouray.....	23
Kelleher and Laughlin, Gilpin.....	22 6-16
McCloud and Ferguson, Clear Creek county.....	22 1-16
Hodges and Traylor, Leadville.....	21 14-16
Jones and Silbey, Dolores county.....	21 14-16
Lewis and Harvey, San Miguel.....	21 4-16
McNulty and Murphy, Aspen.....	21 4-16
Libby and Howe, Clear Creek county.....	21 2-16
Trezona and Waters, Aspen.....	20 14-16
Anderson and Shaw, Boulder.....	20
Epler and Smith Red Cliff.....	17 3-16
Kappeler and Wendish, Red Cliff.....	16 12-16

SINGLE DRILLING.	
D. L. Jones, Clear Creek county.....	13 11-16
William Shea, Boulder.....	17 4-16
Joseph Burns, Leadville.....	16 10-16
Thomas Burns, Leadville.....	16
N. Monach, Clear Creek county.....	15 8-16
G. E. Austin, Boulder.....	9 12-16
John Cullis, Denver.....	13 12-16
J. H. Williams, Gilpin.....	13 6-16
T. Oakes, Clear Creek county.....	13 4-16
S. Manual, Gilpin.....	12 14-16
M. Exchere, Gilpin.....	12 12-16
George Burns, Leadville.....	11 10-16
James C. Munn, Aspen.....	10 6-16
R. J. Lyons, Ouray.....	10 2-16
J. Lapland, Ouray.....	9 12-16
W. R. Martin, Boulder.....	9 10-16
James Manning, Ouray.....	8 10-16
E. R. Godsey, Boulder.....	8 1-16
James Stanton, Denver.....	2 8-16

It was somewhat galling to Colorado that Montana with one team should win the first prize, and the pill did not taste good, although it was paid for fairly and swallowed. So, on evening following, another trial took place, and two from best Colorado teams were combined to heat the record. Special prizes of \$250, \$150 and \$100 were given. The Butte City men decided not to compete in the second contest—giving a plea of not in condition. It was the safer way; also perhaps it was hard for victors to keep in condition and meet many old acquaintances on a holiday trip in a city like Denver. Below is the score of the last evening:

Abeard and Rinker, Leadville.....	31 6-16
O'Keefe and Dwyer, Leadville.....	28 10-16
Mullins and Oates, Gilpin.....	28 3-16
Lindgreist and Fanner, San Juan.....	27 4-16
McCarthy and O'Connell, Hinsdale.....	27 2-16
Short and Manuel, Gilpin.....	27
McCloud and Ferguson, Clear Creek.....	27
Cummings and Hill, Ouray.....	25 6-16

It should be said that two granite blocks were used at the first contest, and although they were from the same section, one was evidently harder than the other, and most of the shallow double-hand holes were drilled in it. Also it was placed edgewise of the grain, while the other was placed with the grains horizontal.

At the last trial, all holes were drilled in one rock.

Probably the records established here will stand for some time, as 31 6-16 inches for double hand and 18 11-16 inches for single hand work in 15 minutes is not easily surpassed.

Alkali—Its Causes and Cure.

[Condensed from an essay by PROF. E. W. HILGARD of the State University.]

I am aware that the question of reclaiming alkali lands, and repressing the increase of their area, has not thus far assumed, in South California, the prominence it has attained in some other portions of the State. The fact that the lands occupied and irrigated are so largely benches and even mesas, has prevented the trouble from arising from the presence of alkali from becoming so widely felt, albeit a great deal of pretty strong alkali land is to be found south of the Tehachapi, and much more of it will before long come within reach of irrigation. I therefore think it timely to bring this matter before this meeting, both in respect to the means of preventing damage by simple means adapted to the gravity of each case, and in order to explain to you the reasons why alkali soils may be regarded as being, intrinsically, among the richest lands within the State, capable of high and lasting production when properly dealt with.

The first point to be discussed, in considering the subject is,

"What is Alkali?"

The chemist will tell you that it consists of soluble compounds—salts—the basis of which is mainly soda, together with smaller amounts of potash, and usually a little lime and magnesia. When these salts exist in the soil to any very considerable extent, then their presence becomes manifested, in summer, by their appearance on the soil surface, in the shape of white crusts or crystals. These represent, mainly, the following compounds, each in its pure state: Sulphate of soda, or Glauber's salt, which you sometimes use as a medicine for cattle and horses; Chloride of Sodium, or common salt, which you know too well to require description; and last, but not least, Carbonate of Soda, or Sal soda—washing soda—with which you are almost equally familiar. With these predominant salts, which are nearly always present in varying proportions, here in much smaller amounts other salts highly important for vegetable nutriment namely: Sulphate of Potash, Phosphate of Soda, or lime, and very often Nitrate of Soda or Chili salt-peter; all ingredients of which the presence in commercial fertilizers determines their value, and which are of prime importance to plant growth. With these we find, usually, to a great or less extent, Epsom salts, or Sulphate of Magnesia, and a little Gypsum, or Sulphate of Lime. Next comes the question

How do These Alkali Salts get Into the Soil?

The reply is that all soils are formed from rocks in which these substances occur in various forms, by the combined chemical action of air and water, and by the mechanical pulverizing action of frost, flowing water and moving ice, or glaciers. The same alkali salts are formed everywhere in the world; but in countries having abundant rainfall they currently wash through the soil into country drainage, as formed: while in regions where rainfall is deficient, the scant moisture only carries them down a little way into the subsoil, from which they rise to the surface by the evaporation of the water, and are there accumulated at or near to the top of the soil. It is right there that nearly all the damage is done; the water in the depth of the soil is very rarely strong enough to hurt the roots of plants directly.

It follows from what I have said that all natural waters must contain alkali salts to a greater or less degree.

"How and Why Does Alkali Rise to the Surface?"

As I have said, it is surface evaporation that brings it up. The soil acts like a wick: and if you will take a lamp wick and plunge its lower end in salt water while exposing the upper end to the air, you will quickly see an "alkali crust" forming on the end. But you also know that different wicks will raise water or coal oil to different heights, according as they are closely woven or loose like candle-wicking. The close wick will raise the fluid higher in the end, but it will rise to its highest point more slowly than when you use the loose wicking. Just so in soils, the close ones will raise the soil water from a greater depth than will the loose sandy ones, but the latter will bring it up much quicker to the full height to which it can rise at all.

If alkali water should stand in a sandy soil at a depth of two feet, very little of it would evaporate at the surface and therefore alkali would show on the surface only slightly, or not at all, while from a clay soil having water, even at twice that depth, the evaporation would be brisk and continuous, and an alkali crust would promptly form. You know well from your experience that alkali is always worse on clay soils than on adjacent sandy ones. Beyond question the damage done by alkali, in at least nine cases out of ten, is due to accumulation at or near the surface. When we examine the soil of an alkali spot for its alkali contents, at various depths, we find five or six times as much in the first inch from the surface down as is contained in the bottom water, or at the depth of a few feet in the soil itself. The top crust is sometimes almost pure alkali salt, and it is no wonder that it should corrode the root-crown, and weaken or kill the plant. It obviously follows that the first requirement in preventing damage from alkali, is to prevent

surface evaporation as much as possible. The first condition in this regard is to lessen the formation of a surface crust. In other words, to keep the soil in deep, loose tilth, or else to mulch it. In either case, surface evaporation is reduced to the lowest point practically attainable. Evaporation through the leaves of plants—for instance, in an alfalfa field—brings up no alkali to hurt. More than half of the alkali land in this State that people are afraid to touch, requires no other remedy than thorough, deep tillage, maintained at all times. But, in bad cases, other means are required; and this leads us to consider which of the above salts is the most injurious.

Your experience tells you that the worst alkali is the "black." Now what is black alkali, and why is it so called?

Not, as some have imagined, because of its moral turpitude, but because it causes blackish-tinted puddles to stand on the ground and on evaporation leaves black rings around the margin of the pool. When we analyze such blackish water we find that its chief ingredient is carbonate of soda—soda-salt—and that the black tint is caused by the humus of soil, which it has the power to dissolve. This itself is a serious injury, for humus is one of the most important of soil ingredients; if held in solution, or washed away through the soil, the prodigious powers of the land are seriously impaired.

Here is a calcareous "adobe" soil wetted with pure water and dried. I throw it on the floor before you and it crumbles into a thousand crumbs. Here is a lump of the same soil wetted with soda-salt solution, and also dried. I throw it on the floor and you hear it strike like a brick-bat, and it breaks into two or three hard clods, which you can just scratch with your nails. You see the extreme importance of getting rid of the "black" part of the alkali in every case. This can be done by giving the soil a dressing of gypsum or land plaster.

Here is a solution of soda-salt: I pass it through a filter filled with black soil; you see the water that passes through is almost as black as ink, and we now have the same solution that you see in alkali puddles where it is "black." Had I time to finish this operation you would in the end find that the black soil turned gray or whitish—just as your alkali spots after the rain has washed out the color.

Now I add to this black water a quantity of powdered gypsum, and shake it up. We shall have to wait a little to see the action completed; but in the end you will see that the solution has become nearly or quite colorless, while the gypsum has turned dark from the precipitated humus. That is precisely the way it acts in the soil—it keeps the humus from being washed away, and above all, it converts the "black" alkali into "white," that is, the carbonate of soda has now been turned into sulphate of soda or glauber salt, which, as I first told you, is one of the chief ingredients of all alkali, and is quite bland as compared with the corrosive soda-salt. We have thus taken the cutting edge off the alkali, and in thousands of cases, this change, with thorough tillage, is all that is needed to do away with all damage from alkali. The amount of plaster to be used per acre, depends, of course, upon the strength of the salts in the soil. Sometimes 500 pounds per acre will be enough, then, again, it may take a ton or even more, and after that, perhaps, an annual dose of from one to three hundred pounds per acre, until the carbonate of soda is completely destroyed.

You may ask how you are to know by an easy test that the carbonate of soda is destroyed. Here it is. This is a paper tinted with a solution of litmus, a preparation you can find in most drug stores; and if not, they should be made to keep it for you. Any acid—vinegar will do—turns the blue solution red; add soda or potash (ash lye) to the red solution and the smallest amount will instantly turn it blue. So with this paper, as you see, I can change the color at will, and if the red paper turns blue when I touch the alkali water, or the wetted soil, I know at once that there is black alkali there, even if it be too little to show by black rings in the mud puddles. Any child can make this test; but you must understand that the change to blue should be prompt. Almost any California soil will in the long run turn litmus paper blue, because all our soils contain considerable lime, which acts like the soda-salt, but much more slowly.

There is one virtue possessed by gypsum that I have not alluded to; it is that when (as is frequently the case) the alkali contains phosphate in solution, these phosphates are fixed and retained in the soil, just as is done in the case of humus; whereas, otherwise, every rain and every irrigation would wash them out more or less.

But if after transforming your black alkali into white and practicing thorough tillage, you still find your trees or vines under stress, there is but one remedy—a radical one, which rides you of all alkali, black or white, for good. That remedy is underdrainage. It is the remedy we have lately found it necessary to recommend for some of your parks where white alkali occurs very abundantly at some points. That this is so is self-evident from the fact that in countries having heavy rainfall there is no alkali in the soils. What prevents it is the natural underdrainage, through the soil into the country drainage. Where this does not exist naturally, it can be established artificially by first laying drain tiles, and then flooding your land until the last vestige of alkali is washed out. Experience fully and amply confirms this

conclusion; but experience has also abundantly shown that alkali cannot be washed off the land by abundant flooding without drainage. All you do in that case is to put the salts down into the subsoil, from which they will rise again at the first chance, and your water and trouble will have been wasted. What you sometimes can effectively do in very bad cases, is to scrape off the alkali crust, bodily, and haul it where it will be carried off by the streams—or, possibly, by the ditches, for the benefit of your neighbor below. Such things have happened.

Placer County Miners.

Delegates to County and State Conventions.

In the PRESS of last week was published an account of the proceedings of the Miners' Convention in Placer county, but lack of space prevented publication of the names of committees and delegates. As stated in the report referred to, Hon. J. H. Neff, of Colfax, called the Convention to order, and he was elected Chairman, on motion of Hon. J. B. Patterson. The Secretaries were J. A. Filcher (of the Placer Herald) and T. B. Everett—the two gentlemen who were the originators of the plan to form a miners' association.

On motion of J. B. Hobson a Committee of five was appointed on Credentials by the Chair, as follows: J. B. Hobson, J. F. Brown, W. D. Perkins, J. C. Boggs and Hon. P. McHale.

On motion of Hon. J. B. Patterson a Committee of five on Permanent Organization and Order of Business was appointed by the Chair, as follows: Hon. J. B. Patterson, O. J. Spencer, J. M. Barney, Wm. Nichols, Jr., and Hon. A. P. Hall.

On motion a Committee of five on Resolutions was appointed by the Chair, as follows: Hon. J. A. Filcher, Hon. Geo. H. Colby, W. B. Thorpe, Allen Towle and Frank L. Sanders.

A committee was appointed to draft laws and rules for the government of the Permanent Association, as follows: J. B. Patterson, S. M. Sprague, T. B. Harper, W. H. Grenell and Hon. P. McHale.

The Committee on Credentials reported the following delegates to the Convention and entitled to seats:

Auburn Precinct, No. 1.—J. Hamilton, J. A. Filcher, D. W. Spear, P. McHale, B. F. Hartley.

Auburn Precinct, No. 2.—John Spaulding (R. F. Burns, proxy), J. B. Patterson, J. B. Hobson, E. C. Uren, T. B. Everett.

Bath.—W. H. Grenell, Judson Wheeler, A. Breeze, T. N. Hosmer, M. Dougherty.

Todd's Valley.—T. Blaoohard, John Schippmann, H. S. Bryan, Geo. Moeller, H. Newman.

McKinsley.—A. C. Gilbert, Wilson Carey, St. Clair Nye, G. R. Cowen, H. T. Power.

Ophir.—James Butts, Sam Kaler, Geo. L. Smith, Geo. Taylor, Al Shurtliff.

Forest Hill.—I. Bowman, Wm. Dodge Jr., Jas. Creighton, Wm. R. R. J. B. Seller.

Michigan Bluff.—E. Poliska, C. P. Udell (proxy, R. L. Dunn), A. Miller, E. O'Connell, Wm. Mair.

Iowa Hill.—J. F. Brown, Jas. Gleason, S. M. Sprague, J. O. Jones, O. J. Spencer.

Sunny South.—R. M. Sparks, Jas. Tickell, M. Holt, J. W. Eggleston, F. Howell.

Rock Creek.—A. O. Bell, E. C. Bellows, J. E. Bisset, Fred Dependence, F. Roberts.

Newcastle.—Dr. M. Schnabel, W. B. Thorpe, J. C. Boggs, A. S. Whitmore, E. L. Hubbard.

Yankee Jims.—J. N. F. ndley, G. S. Sanborn, J. L. Welcker, Harry F. Adams, Thos. Gilbert.

Rocklin.—Dana Perkins, Wm. Harlow, M. Yarrhough, D. Grant, J. L. Levlson, Orrin Rice, C. Clough, F. Hull.

Damasco.—C. F. Hoffman, A. B. Cammell, Applegate.—G. C. Hephurn, F. Rotter, F. E. Colburn, G. D. Wyman, A. H. Applegate.

Gold Run.—E. G. Herrmann, Jason Brink, Wm. Doolittle, James Stewart, E. A. Moody.

Colfax.—Hon. J. H. Neff, A. G. Bell, W. P. Perkins, J. B. Whitcomb, H. Simons.

Dutch Flat.—Dr. Noble Martin, Hon. G. H. Colby, J. M. Barney, Jas. L. Gould, Wm. Nicholls Jr.

Loomis.—E. W. Maclin, Peter Snyder, W. H. Tadebury, Peter Mong, F. N. Cook.

Lincoln.—T. B. Harper, G. Gray, Geo. Felis, C. Kennedy, F. L. Sanders.

Alta.—Allen Towle, A. N. Jones, A. Roger, H. V. Martin.

Roseville.—W. A. Thomas, J. R. Dyer, E. Panabaker, G. K. Kirby, G. N. Harmon.

Allens.—E. L. Hawk, Geo. W. Prosser, D. L. Allee, F. Martin, W. C. Alford.

Junction House.—C. A. Greenfield, A. Armbruster, W. H. Parkman, J. Sheppard, W. J. Robinson.

Butcher Ranch.—E. McKinstrey, W. R. Davis, Geo. Maither, E. B. Gilhert.

Penryn.—A. P. Hall, A. A. Smith.

At Large.—Chas. G. Yale of San Francisco, Hon. T. C. Hooking of Grass Valley, C. L. Cain of Placerville, Pat Campbell of Smartsville, M. J. Ferrell of Grass Valley, H. A. McCreaney of Lake county, R. F. Rooney of Auburn, Amos Stevens of Colfax and F. E. Cannon, John Papa, W. R. Morton, Garrett Booth, E. G. Spencer of Iowa Hill.

It was moved and carried that the Convention proceed to elect thereby delegates to which Placer will be entitled under the call in the State Convention.

On motion of Mr. Filcher, it was decided to select six delegates to the State Convention

from each of the five Supervisor districts of the county, and the Convention took a short recess to allow the representatives from the various Supervisor districts to select their candidates.

On the reassembling of the Convention, the following names were submitted for ratification as delegates and alternate delegates to the State Miners' Convention:

DISTRICT ONE.

Delegates.	Alternates.
E. L. Hawk	
Wm. Thomas	
H. Cashmer	
T. B. Harper	
G. Gray	
F. L. Sanders	

DISTRICT TWO.

Delegates.	Alternates.
Jas. Winn	Geo. Taylor
Otto Walter	Geo. B. Hewes
W. B. Thorpe	Thos. Thorpe
J. G. Boggs	H. F. Albes
M. Schnabel	A. P. Hall
Sam'l Laird	Wm. Tadebury

DISTRICT THREE.

Delegates.	Alternates.
J. B. Patterson	D. W. Spear
J. A. Filcher	T. J. Nichols
J. B. Hobson	E. C. Uren
John Spaulding	R. F. Burns
Jo Hamilton	H. H. Rhomond
B. F. Hartley	R. L. Donn

DISTRICT FOUR.

Delegates.	Alternates.
J. H. Neff	J. H. Barry
Allen Towle	H. V. Martin
Dr. N. Martin	Wm. Nicholls
J. Y. Thomas	E. G. Hermann
A. G. Bell	Amos Stevens
G. N. Colby	J. L. Gould

DISTRICT FIVE.

Delegates.	Alternates.
C. F. Hoffman	A. Breeze
S. M. Sprague	Wm. Muir
H. G. Power	M. Gleason
O. J. Spencer	E. B. Campbell
E. McKinstrey	W. R. Morton
G. R. Gown	

Upon motion, a committee of five was appointed to draft a call for a State Convention, the chair appointing the following as such committee: W. B. Thorpe, Chairman; Allen Towle, Wm. Grinnell, J. A. Filcher and W. D. Perkins. There were subsequently added to such committee the names of Hon. T. C. Hooking of Nevada, C. L. Cain of El Dorado, H. A. McCreaney of Lake, C. G. Yale of San Francisco and J. B. Hobson and P. McHale of Placer.

The above committee was excused for half an hour to prepare its report, and during the interim the Convention resolved to form a permanent Placer County Miners' Association, and a committee consisting of J. B. Patterson, S. M. Sprague, T. B. Harper, W. H. Grinnell and P. McHale was appointed to draft suitable constitution and by-laws for the government of the association.

A committee was also appointed to prepare an address to the people of California relative to the present condition of the mining industry, stating the causes of its depression and explaining the objects sought to be obtained by the proposed State Convention. The committee consists of the following named gentlemen: Russell L. Dunn, Chairman; Dr. M. Schnabel, John M. Fritwell, Geo. H. Colby, J. A. Hobson, J. A. Filcher, Chas. G. Yale, J. H. Neff, Dr. N. Martin, D. W. Spear, and Amos Stevens.

A permanent Committee on Finance was appointed, consisting of J. B. Hobson, Chairman; H. V. Martin, Dr. M. Schnabel, J. O. Boggs and D. W. Spear.

The following Executive Committee was chosen: J. H. Neff, J. B. Hobson, John Spaulding, C. G. Yale, B. F. Hartley; Secretary, T. B. Everett, Auburn, Placer Co.

The resolutions and call for State Convention were published in the MINING AND SCIENTIFIC PRESS of last week, and the address will be found in another column of this issue.

An Anti-Debris Convention.

Associated press dispatches, dated Sacramento, December 4th, are as follows: What may prove to be the opening gun of renewed hostilities between the mountain and valley people—the old anti-sloken fight—was fired here to-day. A convention of Sacramento county farmers was held at the courthouse this afternoon to devise means for shutting down all the hydraulic mines. Ex-Senator Routier was chosen chairman. He said that the miners appeared to be defiant of the law. He thought the farmers ought to form an association to preserve their rights.

Attorney Robert T. Devlin, who is employed by Sacramento county to look after the sloken matters, said that he had no doubt there was a determined effort on foot to resume hydraulic mining. He referred to the Denver and Auburn meetings of the miners, and said the only way to meet this effort is by organization. Congress meets next Monday. That body has declared it is a crime to place upon the banks of a navigable stream any matter that can get into the stream to its detriment. In other words Congress has favored the valley.

The attorney advised the farmers to employ men who will not be known as agents of the anti-debris association to secure evidence in the mines. It is idle to bring suits that will only result in non-suits. The hydraulic miners first fought in the courts, but now that they have been defeated there, they are pursuing

different tactics. The valley people ought to organize and send two trusted men to get the required evidence. Then suits will be brought. No doubt unlawful mining will be resumed as soon as there is water to operate. Chairman Routier insisted that immediate co-operation by the farmers was needed. He thought the supervisors ought to send men to the mines who could get the necessary information.

Mr. Devlin said the supervisors complained of the expense. Several members said they thought it would be cheaper to hire agents than to build levees higher every year, as would be necessary if hydraulic mining was continued. Mr. Devlin said that farmers have been very generous with hydraulic miners. When it was claimed that brush dams would hold back debris, the farmers waited three years for a test. The straight question for the valley is, shall hydraulic mining go on or shall it stop? Every man who owns a home in the valley is interested. The law-breakers claim that there should be found some way to get on the gold without injuring the property of others, but it is their duty to devise that way, if such there be.

The speaker urged the importance of organization. "This is not a fight against mining, but a contest for our homes," he said. "Men who are chosen to go into the mountains must be men who are fearless and honest. If we have men enough, we can stop all mining on the American river."

It was ordered that a committee of two from each supervisorial district should be appointed to devise a plan of campaign. The chairman promised to announce the names of the committee Monday, and the meeting adjourned to meet at 1 P. M. Wednesday, December 9th.

The Mines of Jaho.

John Gildea returned to this city last week from China, where for the past year he has been in the employ of the Chinese Government at the mines of Jaho.

"Jaho is the ancient capital of Mongolia," said Mr. Gildea, "and is about 300 miles inland. On the way to the mines we rode horseback all the distance and passed through many villages, the inhabitants of which had never seen a white man. In some places the women and children would double-lock the doors and hide; while the men would follow us wherever we went out of curiosity. They didn't understand how we came to be without queues, and were mystified at our appearance and dress, but no attempt was made to molest us."

"The Jaho mines are extensive, and consist of a lode of 60 miles long and 100 feet wide. The ore is silver-bearing, but will not average more than \$12 a ton. About 1000 coolies are on the pay-roll, and each one gets about \$5 50 a month in Mexican money. They are the greatest thieves I ever saw, and many of them, just for the love of stealing, would steal a piece of ore perhaps not worth more than five cents, though if the pilferer was caught, he would lose his pay and be hamboozed beside. This punishment is given by striking the man on the muscles of his bare legs and often so severely that the flesh is cut through to the bone."

"Much of the mining machinery is first class, and was sent from this State, and I doubt if any mine in the United States is better equipped with modern machinery than the mines of Jaho."

The 11 Americans who are in charge of the mines left San Francisco about a year ago, and are Superintendent Darlington, Head Furnace-man Dexter, Mill Superintendent Myrick, Professor of Mineralogy Crabtree, Chief Engineer O'Day, Foreman O'Day and Ryan, and Shift Bosses Jandy, O'Toole and Gildea.

Sampling Ores.

The Black Hills Times in speaking of the Aurora Smelter, says:

Judge S. P. Romans returned yesterday from a brief visit to the Illinois plant, which he found to be one of the most complete and best arranged works in the country, their method of treating and sampling ores being superior to that in vogue at Omaha. In unloading a car of ore, every sixth barrowful is put aside. It is then crushed and pulverized, taken into another room, where it is thoroughly mixed and quartered; thence to another room, where the sample is still further reduced in size, and three bottles filled with the pulp and sealed. From this room they go to the assay department, each bottle being labeled "Lot No.—." The assayer takes a certain number of grammes from each, and from the three assays the value of the ore is obtained. A straight charge of \$10 per ton is made for treatment, the mine getting full pay for all the gold, silver and lead contained in the ore. At the Omaha works, ores containing less than a certain amount of silver do not get any credit for that metal, so that the only additional cost between the two points is that of \$1.50 per ton for transportation. The Aurora plant has a capacity of about 250 tons per day, which can be pushed if necessary to 300 tons. Vice-President Van Arsdale of the company made it very pleasant for the Black Hill delegation during their visit, and stated that his plant would receive at any time 25 to 30 carloads of Black Hill ores. He was surprised to hear that information had been received in Deadwood that his company had declined to receive the special ore train of 22 cars lately forwarded.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE ASTORIA.—Amador Ledger, Dec. 5: The Astoria, Hollywood and Middle Bar claims, all close neighbors at the southern extremity of the mineral belt in this county, and all organized into independent corporations for the purpose of stock-dealing in New York, are in a state of sound response, as far as the development of their mineral resources is concerned. They are unpatented mines, and for years only sufficient work has been done to satisfy the United States laws. The surface works and underground developments are not worth mentioning. People hereabout pay no attention to the frivolous operations which have distinguished these claims; they cut no figure whatever in the mineral development of this region. It has seemed to us all along that the object is to work off stock on the over-credulous in New York rather than an honest endeavor to search for mineral treasures here.

KENNEDY.—At the Kennedy they are engaged in sinking the sump at the 1550 level. Sinking will be finished by the end of this month. This will give 200 feet of new ground to operate in, namely, at the 1450 and 1550 levels, neither of which has been touched as yet. The monthly cleanup was made this week. Although it falls far short of the big yields a few months back, when from \$30,000 to \$40,000 was disbursed in dividends per month, still it was sufficient to leave a handsome sum to be divided among the shareholders after paying all expenses. The shaft of the South Eureka is down about 300 feet. Considerable quantities of quartz are met with, but not of a paying grade. Sinking will proceed until a depth of 500 feet has been reached, when drifting for the ledge will be in order. The new hoisting works at the Clinton Consolidated mine are running satisfactorily. The mill has also been kept running steadily since the repairing of the ditch.

BUNKER HILL.—Cor, Amador Ledger, Nov. 5: The Bunker Hill mine is still idle, and as yet the employees have received no encouragement from the company. It will be remembered that the company agreed to settle up the back pay within five months from July 1st, and also to pay the men once a month for labor performed within the five months. The time expired the first instant, and the miners are about two months further behind now with their wages than on July 1st. The town is very dull at present, as a number of men are thrown out of employment.

OLETA.—The new mine will start up in a few days. The engine has come, and will be erected as soon as possible. The boarding-house and other buildings are almost finished, and will soon start up in full blast.

Butte.

BROWN'S HILL MINES.—Oroville New Era, Dec. 4: A great deal has been said about the rich strike made at Brown's Hill by the Wheeler Bros., and the outlook now is that they have a perfect bonanza in sight. In conversation with a New Era reporter, James Wheeler, one of the owners of the mine, stated that they have four men at work now, and they are averaging \$20 per day to the pick. It has been said by some that the boys have struck merely a quartz pocket, but Mr. Wheeler tells us it is an 80-foot channel from 3 to 5 feet in depth, containing large washed boulders, one of which it took them 26 days to blast through, which explodes the theory of a pocket. Mr. Wheeler brought down some samples of the gravel with him that is very rich. He also brought some samples of quartz from the ledge owned by Paul Willott, at the same place. Specimens of the quartz taken at random assay as high as \$100 to the ton. Mr. Wheeler also has a ledge located which prospects very rich. Brown's Hill bids fair to become one of the liveliest mining camps in the State next season. Five different companies will operate there next season. A good wagon road has been built into the mine.

El Dorado.

RICH GRAVEL.—El Dorado Republican, Dec. 3: A strike of rich gravel was made in the Franklin mine, near Placerville, last Monday. For some time the owners, Geo. Allen, Len Hart, A. S. Tokey and others, have been running a tunnel about 400 feet in length to prospect, ventilate and drain the mine. Their efforts have been rewarded by the discovery of a rich body of gravel, which is believed to be extensive and which promises remunerative work for some time.

SALE.—We learn that Geo. Patrick has purchased a one-half interest in the Schultz & Bombach mine, north of Coloma, the price being \$200. The mine will be under the management of Schultz & Patrick, Mr. Bombach having nothing further to do with it.

Humboldt.

MAPLE CREEK.—Blue Lake Advocate, Dec. 5: Mrs. Preston was in town Wednesday on the way to the Bay with a load of coal from the Maple Creek mine. The shaft is now about 50 feet deep and the vein has increased in size until it is at present 6½ feet in thickness. The quality of coal is good and every test of its merit as fuel has proved entirely satisfactory. As all indications point to an inexhaustible supply on Maple creek, the prospect of benefit to the county grows steadily brighter. Mrs. Preston informs us that she has been offered \$40,000 for her mine on the creek, but she assures us that she has no intention of parting with it at those figures. Work in the shaft will go right ahead, though the situation is such that only a small crew can be employed. The bottom of the shaft is now one solid mass of coal, and it is thought that the dimensions of the vein are really much greater than those of the shaft.

DEPOSITS OF KAOLIN.—Field Assistant Watts of the State Mining Bureau, recently in this county, took from the ranch of A. J. Moore, on Maple Creek, a quantity of the peculiar clay to be found in that section. We understand that analysis proves the deposit to be kaolin. Kaolin is that variety of clay which is used in the manufacture of porcelain.

Nevada.

MILL STARTED.—Grass Valley Telegraph, Dec. 7: For the past week the mill at the Idaho mine

has been closed down and all hands therein laid off. This was done because the shaft from the 1800 to the 1900 level was in such a condition that it had to be repaired. The shaft has now been placed in good repair and the mill resumed its work this morning.

MALTMAN REDUCTION WORKS.—Nevada Transcript, Dec. 8: Fred W. Bost, one of the most experienced and skillful ore workers in the county is about to start up the Maltman Reduction Works on the lower Grass Valley road, which have been idle recently on account of the failure of Mr. Maltman's health. Mr. Bost is putting the machinery in thorough repair, getting in fuel and making other necessary preliminary arrangements, and will soon be prepared to reduce ores of all kinds. These works have for years had the merited reputation of being among the best on the coast.

THE FEDERAL LOAN.—The Federal Loan with its five stamps continues to turn out more than enough gold to pay its way and the stockholders are consequently as well satisfied with the world as ever. Two large bars of bullion were sent to San Francisco last week, and quite recently about 100 tons of sulphurets that will give close to \$150 a ton, judging from the assays that have been made, were shipped to the Globe Works in Denver, where they will be reduced.

A PROSPECTIVE BONANZA.—The development of the Craig & McKenzie gravel claim is being pushed, and many old drift miners, who have examined it, are of the opinion that it will prove a bonanza, when opened up so as to give room for a full force of workmen.

A PIETY HILL PRODUCER.—J. J. Meacham and Luck Voyce, who are working a ledge in the former's house lot on Piety hill, continue to take out rich ore. Some found a few days ago pans out about \$200 a ton in free gold. The claim is being developed as fast as it can be with the limited facilities at hand.

BUSY CUSTOM MILLS.—There is much prospecting going on all around the city. The Nevada Co. and Locklin custom mills keep their stamps dropping prettily steadily on various lots of ore, and it is pleasing to know that most of the ore being milled is giving profitable returns.

LOOKING AT A MILL.—The Harmony is hoisting good gravel right along. Supt. Hothersoll and Millwright Ostott went to You Bet, to-day, to take a look at Judge Brown's ten-stamp mill, and the company will soon buy and put on their claim that or some other similar piece of machinery. Everything indicates that the only way to get near all the gold out of the gravel is to crush it.

THE CHAMPION.—The Champion is running its 15 stamps and paying well. One of the handsomest bars ever seen in the district was made at the mine last week.

THE MOUNTAINEER.—The Mountaineer also has a full crew of men at work. The mine is another of the stand-bys of Nevada City. It has been paying ever since the latter seventies, and has not yet reached the acme of its possibilities.

THE MANZANITA.—At the Manzanita the tunnel from the bottom of the 225-foot incline is in 400 feet and going ahead toward the channel at the rate of 30 feet a week, 7 men being employed. It is estimated that the channel will be entered within 700 feet.

WEST HARMONY.—At the West Harmony nothing but repair work has been going on since last Friday, when the snow and cold weather blocked the Central House ditch. The water will not, even under the most favorable circumstances, be running again till the latter part of this week. The company has a steam engine on the ground, and will get it in shape the next few days to operate the hoisting and pumping rig when the water supply is short.

PEABODY MINM.—Grass Valley Telegraph, Dec. 3: The Peabody mine is looking well enough to satisfy the owners. The very rich specimens that came out last week, and which created an excitement in mining circles, are not all that is to be found in the mine. This afternoon a portion of the ledge below the 300 level was taken up, and the ore is rich, almost but not quite as rich as that that came out several days ago, and which was deposited in bank the same as bullion. The ledge on the bottom is over a foot in thickness. The shaft is being put down, with all speed, for the 700 level.

THE WYOMING MINE.—The Wyoming mine is in Boston Ravine, on the east side of Wolf creek, near the residence of Patrick Riley. There is a fine ledge at the bottom of the shaft at the depth of about 30 feet. The ore taken out to-day showed well in mineral, and some of it was very rich in free gold. The mine shows most excellently well for the depth attained.

W. Y. O. D. MINE.—Grass Valley Union, Dec. 5: The 800 level of the W. Y. O. D. mine is opening out in fine shape, and shows that the pay chute is lengthening on the veins as depth is obtained. The ore is of high-grade, and the vein occupies the whole width of the drift on that level. The shaft is also being sunk for the 900-foot level. The mill is for the present kept going with the ore that is stopped out between the 6th and 7th levels, while there is on the dump, which was accumulated while the new mill was being built, 400 tons of ore, all of which will yield profitably. Since the new ten-stamp mill started up, the clean-ups have been very profitable, and by the first of the year all of the new improvements will be paid for out of the product of the mine, and soon thereafter the payment of dividends will be resumed. There are 50 men employed about the mine and mill, and the company disburses monthly \$5000 for labor and supplies. The W. Y. O. D., from its present output, and reserves of ore in sight, is now entitled to rank with any mine in the district.

WASHINGTON DISTRICT MINES.—Transcript, Dec. 3: F. L. Cooke of Maybort, who some time ago bonded the Governor Morton mine, found some good ore, but not sufficient to justify him in closing the trade when the bond expired. He has therefore obtained an extension of 60 days, and before that period ends will have the ledge opened up so he can determine its prospective value closely. Owing to the recent development of the ledge in the lower tunnel of the German mine, giving backs of 258 feet and a large body of good quartz, a mill will be constructed on the claim as soon as Supt. Cooley can have the machinery hauled in. He goes up to the mine this week to push the underground work ahead and put everything in readiness for taking out ore,

Plumas.

GREEN MOUNTAIN MINE.—Bulletin, Dec. 3: On Thursday of last week, we made a short visit to the Green Mountain mine, owned and operated by G. P. Cornell, and superintended by A. R. Bidwell. It was a pleasure to note the many improvements which had been made in and about the mine, and the activity manifest on all sides. Needed repairs have been completed on the mill, on the boarding-house and other buildings. A new and substantial cellar for storing vegetables and fruits has been added. Thirty stamps are running on ore which pays a good profit. Superintendent Bidwell is pushing development work in all directions. Thirty men are employed and they are kept busy attending to their various duties. This mine has a most beautiful location on the side of the mountain overlooking Indian valley. The Green Mountain mill is run by water under a great pressure, furnished from the Round Valley reservoir, whose ditches and pipes are in better condition than ever before. The main tunnel is in the mountain over a mile, and without a crosscut of any consequence. The country on either side of this tunnel, therefore, is practically unexplored. The Cherokee group of mines, beyond the face of the main tunnel, is under the same control as the Green Mountain, and through this tunnel they and others can be tapped at great depth.

San Bernardino.

MORE IMPORTANT.—San Bernardino Kaleido scope: The mining interests of this county are becoming more important every year, and it will not be long until the great desert country with all its vast expanse of sand and barren hills, will be as valuable as the fruitful valleys on this side of the mountains. From all parts of the county comes news of extensive work in prospecting rich-looking claims, and we hope it will continue until the mineral regions will be a source of revenue to the county and to the men who endure such great hardships in hunting for the hidden treasures. The Rose mine in Lone valley, recently purchased by a Riverside syndicate for \$30,000, is being rapidly developed and a large force of men is employed. It promises to be a very rich mine, and other prospects in the near vicinity now being worked on are looking very favorable. T. F. Chapman, the gentleman who purchased the Sidewinder mine and mill at Victor of F. A. Urban, has shipped two good-sized gold bricks to this city within the past month, and has now gone to Oakland to purchase additional machinery for his mill. He already has ten stamps in full operation, but the capacity is not sufficient for the output of the mine. The ore is not free milling, only one-third being free gold, and the balance, concentrates, the latter being shipped to the Selby Smelting Works at San Francisco, for reduction, a carload now being ready for shipment. The ore averages \$35 per ton and about 20 tons per day is produced. About 30 men are employed at the mill and mine, and with every foot of work the ore looks better.

Shasta.

TEXAS CON.—Shasta Democrat, Dec. 2: Twenty stamps are now in operation on the Texas Consolidated mine, Old Diggins. This is said to be the most substantial and best equipped milling plant in this part of the State, and now Mr. Hart proposes to put up a chlorinating plant as an addition to the mill.

A NEW MILL.—Wm. P. Miller and Fred Grotefend, owners of the Oro Fino mine, in Lower Spring district, have concluded to put up a ten-stamp mill on the river at a point a few hundred yards below Middle creek, and now have men at work leveling off the foundation. The plant will be complete with modern improvements and four Triumph concentrators.

GLADSTONE.—Within the past week big developments were made in the Gladstone mine. For some time the vein in the lower level has averaged from 10 to 13 feet in width. A few days ago the vein at this point widened out to 30 feet, all of it being good milling ore, and three feet of which is fairly speckled with coarse gold, a large sample of which can be seen at the bank of Shasta county. The Gladstone is proving to be one of the biggest mines on the coast.

BULLYCHOOP.—R. G. Hart, Sr., has put a gang of men to work on the Bullychoop mines, the property lately incorporated. This winter he will clean out the old works and do some new development work, and next spring will put up a crushing and chlorinating plant. He has been experimenting in a small way at the Texas Consolidated with the heavy sulphurets of Bullychoop with very satisfactory results, and knows now just what kind of a plant is needed to work the refractory ores of that group of mines. It will not be many months before Mr. Hart will have 20 or more stamps with a large chlorinating plant at work on Bullychoop.

BONDED CLAIMS.—Shasta Courier, Dec. 5: The syndicate of Sacramento and San Francisco men, who recently bonded Penrose & Gruber's mine for \$10,000, have eight or ten men here doing assessment work on the ledges owned by them. Besides the Penrose & Gruber mine, which is situated at the mouth of Gambler's Gulch, just out of town, this company has secured control of other locations within a mile, east and south of Shasta.

Sierra.

THE GIBRALTAR.—Mt. Messenger, Dec. 5: Gravel has been found in the Gibraltar drift claim, situated above the Red Oak and not very far from the Four Hills. An upraise was made from the tunnel, and at a height of 60 feet very good looking gravel was found, which contained gold. Further explorations will be made as rapidly as possible.

GOOD CLEANUPS.—Dave Vega of San Francisco, brother-in-law of Fred Morris, Supt. of the Tecumseh (late Marguerite) quartz mine, called on us Monday, and reported 30 men working there and 20 stamps crushing ore. Two good cleanups have been made.

Siskiyou.

PAID HANDSOMELY.—Yreka Journal, Dec. 2: The Cherry creek ledge, extending from Greenhorn creek to Cherry creek on Deadwood mountain, paid handsomely from last crushing made. The ledge is nearly two feet wide, the quartz being hauled to Diggle's arastra at Deadwood for crushing. Mr. Ironside, who is superintending the work, and owner of the claim, has bought out his partner, James Wheeler, having realized sufficient money, after paying \$2.50 a ton for crushing, to meet the amount for which the half interest was bonded to him some time ago. Barnes & Peters are also finding some

good paying quartz ledges on Deadwood mountain divide, between Greenhorn and Cherry creeks, and expect to develop them during the coming winter toward realizing rich paying property next spring.

CINNABAR.—The cinnabar miners on the West Fork of Beaver creek, Siskiyou mountain, have shut down the furnaces and will devote their time in drifting to find a permanent ledge. Instead of finding a mountain of cinnabar, as at first supposed, the clay adjoining the float cinnabar contains no quicksilver, hence the change in operations. No doubt a rich ledge or rich chimneys exist in the vicinity, just as rich quartz ledges do in the vicinity of rich pockets, but they ought to be located first. A couple of experienced quicksilver miners have been sent to the mine by the company to assist in development, who say the indications are excellent for finding extensive lodes of cinnabar.

BLUE GRAVEL.—Lee, Lash & Co. are still sinking their new shaft at Greenhorn, being obliged to go much deeper than expected in reaching bed rock, for purpose of draining the blue gravel, but they will soon be able to commence drifting and breasting out again to better advantage. When the pump is set in the bottom of this new shaft, they can work a large area of ground, known to positively contain rich blue gravel.

Tuolumne.

PROPOSED REDUCTION WORKS.—Union Democrat, Dec. 5: Col. Caleb Dorsey of Oakdale arrived in Sonora Monday, on his way to his mining property situated on the Stanislaus river in this county. Col. Dorsey contemplates the early erection of reduction works on the property, which is regarded as very valuable by mining men. The ore is of unusually high grade in free gold, and the two veins of which the property consists are strong and well defined. The water of the river will be utilized for motive power, and the cost of mining and milling reduced to the minimum.

BADGER.—The purchase price of the Badger mine, held under bond, has been paid to Messrs. Yancey & Martin, and it is now the property of Messrs. Palmer, Ellis & Tryon of Gilroy, with Mr. George Stayton in charge as superintendent. Mr. F. M. Johnson of San Francisco arrived in Sonora four days ago to inspect the mine for parties who may purchase it from the new owners. Mr. John Maxwell, resident manager of the Bellevue mine, returned to the mine after an absence of several days, having been engaged in the examination of certain mining property situated in another county. Mr. A. B. Cruikshank of the Mary Ellen mine, the mill on which was lately burnt, has taken charge of a mine near Big Oak Flat for Eastern parties. The Mary Ellen mine is now under negotiation for sale to parties in the East.

Yuba.

SMARTSVILLE GRAVEL MINES.—Nevada Transcript, Dec. 5: James Sneed and a party of Marysville capitalists were at Smartsville Sunday. It is said the result will probably be a new mining enterprise. C. F. Ayer has discharged about one-half of the force in the old Wheaton mine for a few weeks, until the drain tunnel, which is being pushed ahead as rapidly as possible, is completed. The persons working the old Ayer mine in Mooney Flat and the Pinch Back mine, also in Mooney Flat, are taking out some very rich dirt.

NEVADA.

Washoe District.

CON. CAL. AND VA.—Chronicle, Dec. 5: There has been extracted from all parts of the mine during the week 4491 1800-2000 tons of ore, of which 62 160-2000 tons were shipped to the Morgan mill and 1429 1040-2000 tons to the Eureka mill. The average assay value of all of the ore worked at these two mills during the week was \$23.75 per ton. The Morgan mill was stopped a few days on account of an accident to its engine, and the Eureka mill is now running in place of it.

OPHIR.—1465 level—Have continued our prospecting work in the openings leading from the point where the upraise from the sill floor of this level connected with the drift runs west from the winze 122 feet below the sill floor of the 1300 level, and have extracted therefrom and raised to the surface during the week 42 tons of ore, the average assay value of which is \$18.70 per ton.

MEXICAN.—On the 1465 level, the winze started at the end of the crosscut run west from the main north lateral drift at a point near the south boundary line of the mine, 132 feet in, has been sunk 14 feet; total depth, 59 feet; in porphyry carrying lines of quartz.

SIERRA NEVADA.—West crosscut No. 1 from the northwest drift, 630 level, 571 feet from the shaft, advanced a total distance of 1368 feet.

UNION SHAFT.—West drift, 900 level, is out west of shaft a distance of 1360 feet; face in porphyry.

SILVER HILL.—The northwest drift, 50 level, is out from the shaft 380 feet; face in porphyry. The south crosscut 160 level is out from the winze 820 feet; face in hard porphyry.

BULLION.—The joint crosscut, 1300 level, is advanced a total length of 182 feet; face in porphyry and clay. South drift from Potosi winze, 1400 level, is advanced a total of 266 feet; face in porphyry.

ANDES.—On 420 level north drift from east crosscut No. 4 advanced 22 feet, continuing in quartz, giving low assays. East crosscut No. 5 from main north drift extended 20 feet; face in quartz.

OCCIDENTAL.—West crosscut from the south drift, 350 level, has reached the south wall, and we have started an upraise at that point to connect with the 300 level. The crosscut from the 400 level has been connected with the winze sunk from the 300 level. Will continue on the ore found at that point.

CON. NEW YORK.—The west crosscut No. 4, 90 feet north of shaft, 650 level, is out 16 feet; face in clay and porphyry. The east crosscut from the north lateral drift, 750 feet north of shaft, 1100 level, is out 42 feet; face in quartz yielding low assays.

POTOSI.—The raise on the 1230 level, 234 feet south of north line, is up 18 feet; top of raise shows porphyry and streaks of quartz. The joint crosscut, 1300 level, on south line, is advanced a total length of 382 feet; face in porphyry and clay.

BEST AND BELCHER.—1000 level—Upraise No. 1 has been carried up 14 feet; total height, 64 feet; face in soft porphyry.

GOULD AND CURRY.—200 level—South drift from east crosscut No. 1 has been extended 16 feet through soft porphyry and bunches of quartz showing some value; total length, 104 feet. West cross-

cut No. 1, from top of upraise No. 1 from 300 level, has been cleaned and repaired a total distance of 36 feet and stopped.

ALPHA.—The south drift from winze, 80 feet north of shaft, 550 level, is out 105 feet; face in quartz yielding low assays. The north drift, same level, is out 89 feet; face in quartz and porphyry.

UTAH.—725 level.—At a point 150 feet south from the winze station, east crosscut No. 3 has been advanced 38 feet, cutting into east country formation. Work in this crosscut has been stopped, and a west crosscut will be started from near the winze station.

Robinson District.

AN EXTENSIVE FIELD.—White Pine News, Dec. 3: There is no other district in Nevada where the mining field is so extensive and the ores so varied in character as here. On the lower belt are immense bodies of gold and copper ores, while on the upper or western belt, large ledges of silver-lead ores abound. Some very rich streaks of both gold and silver have been encountered, but the district as a whole is what we call a low-grade proposition here, for the reason that it does not pay our miners to ship 200 miles by team and again by rail to a market. When the railroad comes this way and life and capital is infused into Robinson district, it will prove to be "the greatest mining center in Eastern Nevada."

Tybo District.

BETTER DAYS.—Eureka Sentinel, Dec. 5: Mr. Jo M. English, the well-known mine operator, arrived here by Tuesday's train on his way to Tybo, where he has extensive and valuable mining interests. In company with Mr. N. Wescott, he left by private conveyance for Tybo on Wednesday. Mr. English owns and controls the property of the Tybo Consolidated Mining Co., known in the early days as the "Two G" mine. We understand that Mr. English has in view the reorganization of this famous property and is once more placing it on an active producing basis. The Tybo Consolidated, or "Two G," yielded nearly four millions of dollars in bullion in its palmy days, and it is yet scarcely more than prospected.

ARIZONA.

CONCENTRATES.—Prescott Courier, Dec. 3: Ike Hester's freight trains passed through town Friday, loaded with 12,000 pounds of concentrates from the Senator mill and mine for Copper basin. William Connor is in town from his camp at Hillside. Mr. C. has been working ore from his Ajax mine by arrastra process, being quite successful. The ore is mostly free-milling gold, and he finds that he can do much better working it in arrastras than by shipping to Colorado. Fred Williams is in from the Senator country, where he says a great deal of assessment work is being done. Says he is taking out blocks of rich ore from his claim. F. Scovel is in town from his mines in Crook canyon. Mr. S. is now running two of his three arrastras, by steam-power, and has recently put up a wheel to utilize water-power for that purpose during the winter. He has been working these mines and grinding the gold out in arrastras for several years, and in consequence is now very well fixed financially, besides at the same time developing his mines.

ORO BELLA.—Prescott Courier, Dec. 4: Richard S. Barnes, president of the Oro Bella Mining Co., who returned to Prescott Thursday last from an inspection of the company's property at Bayard, reports most favorably upon what he saw there. He was impressed with the remarkable progress made by Col. Spear, superintendent. Everything pertaining to the camp is in excellent order. Caved tunnels are being opened and repaired with new timbers, and important changes are being made in the tramway, one of which is a new grade from the Lower Grey Eagle tunnel to connect with the incline to the mill chute. The most promising strike yet made under Col. Spear's superintendency is the 2½-foot vein in tunnel No. 6 (Oro Bella), found by crosscutting at a distance of 200 feet from the mouth. After several assays of the ore body, he found it to be very rich, both in gold and silver, one of the assays giving a value of about \$125 per ton, although the president prefers to adhere to the figure given last week in this paper of \$60, as perhaps being more nearly correct. The vein continues the same after drifting, and it is believed will prove one of the most profitable veins yet uncovered by this company. Tunnels 5 and 4, above, are also being run in good ore bodies, which are being gradually developed. Col. Spear does not wish to start the mill until he has a good supply of ore to work upon, but believes the time is not far distant when there will be plenty in hand to be treated. The company owns four mines—Grey Eagle, Ash Spring, Oro Bella and Oro Bonita. Most of the work has been done on the latter two. In doing assessment work on the Ash Spring, a vein of good ore was struck quite recently.

FROM THE GUNSLIGHT.—Prescott Citizen, Dec. 5: The Gunsight camp has met with a small disaster. The 20 stamps—two of them just put in—had been pounding the rich rock to powder just two days, when an awful crash in the engine room told that something had gone wrong. A portion of the machinery was found broken, though nothing more serious than can be repaired at Los Angeles. The engineer left that night for California and probably are now the 20 stamps are again reducing the rock twice as fast as in the days gone. The improved facilities of the present machinery are expected to bring forth far better results in working the ore than heretofore. Twenty men are working at the Gunsight, all of them in the mine during the shut-down. Only four or five men are required for the mine proper when in running order.

AT GOLD BASIN.—Mohave Miner, Dec. 5: Jno. Birnett, owner of the Mountain of Gold Ore, discovered recently at the lower end of Gold Basin, is making preparations to develop his claim in a systematic manner. His partner, J. McKenize, having lately sold a mine in Creed's Camp, Colorado, for \$20,000, they are now in shape to open up their property without resorting to the slow method of grinding out a working capital with an arrastra.

MUSIC MOUNTAIN.—J. W. Munn of Music Mountain has opened up a body of silver ore which for richness and extent surpasses anything ever found in the district. The new find was encountered while drifting at the depth of 100 feet, and is taken out in masses of nearly solid horn silver. A test run of the first ore taken out yielded at the rate of 790 ounces per ton. Mr. Munn has four men

employed, and expects to ship hereafter in carload lots.

GOLD BUG.—The ore from the Gold Bug mine, Minnesota district, which was worked at the sampler last week, gave a return of \$600 in gold per ton. John Nolan, who has just come up from the mine, informs us that richer ore than ever is being taken out in sinking the shaft. In some places, the ore is a solid mass of gold. Forty tons of Diamond Joe ore were shipped from Hackberry to the Pueblo smelters for treatment last week. The ore is second-class and averages 200 ounces per ton. We are informed that Diamond Joe still continues to improve as work progresses.

BRITISH COLUMBIA.

THREE FEET OF ORE.—Nelson Miner, Dec. 5: The crosscut tunnel on the Dandy has cut what is supposed to be the main ledge. It is full three feet wide, the ore being very free from gangue and of a better grade than that in the bottom of the shaft. The ore on the hanging-wall carries considerable lead, while that on the foot-wall is mainly copper. The foot-wall is well defined. By approximate measurements, the tunnel is at least 100 feet below the bottom of the shaft, that is, by the dip of the vein. Drifts are now being run both ways from the tunnel. When asked his opinion of the strike, Superintendent Ray, who, by the way is not a 'boomer,' replied: "I consider that we have something pretty good."

DAKOTA.

HARNEY PEAK MILL.—Deadwood Pioneer, Dec. 2: The main mill building of the Harney Peak Tin Co. is completed, and the delay is now for the machinery. This will not commence to arrive until the railroad spurs are finished, which will be about Jan. 1, after that it will require about three months to place the machinery in position. Superintendent Childs is confident of the outlook, as evidenced by the recent order given to Fraser & Chalmers for three hoists capable of raising rock 2500 feet.

SOUTHERN HILLS.—Developments in the silver district of the Southern Hills continue to show up heavy veins of high-grade ore. Along Jim's creek a large number of prospectors are at work and indications are good. The Caliboga is still taking out ore from the 100-foot level and drifting on the ledge. The shaft has been sunk 130 feet, but the water came in so fast that it could not be handled without a pump. The ore at this level is more extensive and richer than above.

IDAHO.

EASTERN ALTURAS.—Wood River Times, Dec. 2: The prospects of Eastern Alturas were never better than they are at present. Mr. Harger, superintendent of the Big Copper mines and smelter at Cliff, recently received orders from the headquarters of the company in New York to get everything in readiness to resume operations on an effective scale as soon as men and supplies can be got in in the spring. The Bannack Co. is getting in shape to work on its mines and start up its mill in the spring. The Hub mine, recently sold at sheriff's sale to Winters & Greenough, will either be worked by them on an extensive scale or by the old owners, who, it seems, must infallibly redeem it.

ONTARIO.—Idaho Avalanche, Dec. 5: A specimen of ore brought down from the Ontario mine on Florida mountain, the property owned by Messrs. Herndon, Sullivan and Mattison, has been much admired, and shows that those gentlemen have a show for a big mine. They run in a crosscut 50 feet, cutting the ledge 35 feet deep, and have run on the vein for 70 feet on good ore all the way. For the shallow depth, they have a splendid showing. The ledge is 12 feet wide. They are now starting an adit tunnel, which will run 150 feet deep on the vein. On the Independence claim, which is the north extension of the Ontario, the Idaho tunnel, started a number of years ago, will tap the vein 900 feet deep. They have just finished assessment work on this tunnel, and propose soon to begin driving it to the center of the mountain. Brooks has put on sleds to haul Poorman rock to the mill. They are putting up some new building to handle ore more conveniently at the Poorman. The bonanza chute of ore on the Poorman will soon be the yielder of the camp. Men are busy timbering and preparing ground to stope. The manager says he will shortly be able to show an output which will enhance the fame of the camp.

OPAL MINES.—Moscow Star: S. Frankel of New York, president of the North American Gem Opal Mining Company of this city and one of the heaviest dealers in precious stones in the United States, sailed for Europe Tuesday, having in his possession 5000 karats of opals that were mined three and one-half miles from here, valued at from \$30 to \$50 per karat, which he will dispose of, and will also float \$25,000 worth of the company's stock there. The opals which he has with him are the result of the company's operations since August—good pay for the work, surely. The field where the mine is located has been prospected thoroughly, and it shows up as well as the present prospect. The idea, therefore, is apparently to get the wealthiest capitalists in Europe and the United States interested, and develop the industry on a gigantic scale. It is not at all improbable that Moscow may yet become the opal mining center of the United States—or, possibly, the whole world.

MONTANA.

FROM BOULDER CITY.—Mining Journal, Dec. 2: The outlook for the mining interests of this district never looked more promising than at present. There is being more actual mining done, and with better returns to the miners than ever before. The Boulder Sampling Works at this place have been kept running to their full capacity almost without a break for the past four or five months, handling from five to six cars of ore per week. Of course a great deal of this increased activity is due to the erection of smelting works in our midst, for this means a market at home for all our ores, with a vast saving to mine owners in transportation charges. Our "Aladin's lamp" or "miner's candle," has been bid under a bushel to these many years, but the day has come when mining men and capitalists are beginning to recognize the vast extent and resources of our mines. There is a grand opening at

this point for a man or company with small capital to erect a concentrator. There is at least 50 mines and prospects within a radius of five miles of Boulder that have uncovered and already on the dumps thousands of tons of ore that would pay to concentrate and leave a handsome profit to miners.

ELECTRIC LIGHT IN MINES.—Butte Inter-Mountain, Dec. 5: The Blue Bird Company has the honor of being the first to light up a mine in Montana by electricity. The Anaconda, Lexington, Jay Gould, Drum Lummon and others have had electric lights for years, but only at the stations. The Blue Bird installed a plant some time ago for the purpose of lighting up the stations, and finding it so economical, safe and pleasant, decided to place the lights on every level, in drift, stope and winze where work was being done. The stations were supplied with 50 candle-power lamps, and 16 candle-power lamps were placed in other parts of the mine. Some of the lamps were placed at a distance of 2000 feet from the station. Besides the electric light, a system of electric bells has recently supplanted the time-worn cord. This system is arranged so that when a signal for a cage is given on any level, the signal is rung on every station in the mine. In this way, the station tender can be notified if he is wanted on any level without going to the surface.

THE COMBINATION.—The Combination M. & M. Co. expect to have the improvements and repairs on the mill finished and ready to start in full blast by this date. About a year ago the mine was closed, owing to the drop in silver. There are in all about 24 claims owned by this company. Mr. McClure, one of the principal stockholders in the Granite Mountain, is its president. When work was resumed on the properties, a diamond drill was brought into service, and in a short time a four-foot ledge of ore was struck, assaying from 25 to 50 ounces. It is estimated that enough of ore has been uncovered to keep the mill running for two years. A short time ago, a 12-cent assessment was levied on the stock. This assessment was made to put in the additional stamps, a new boiler and hoist, and for the erection of two new hoisting works upon the two shafts. Those interested say that the future prospects look good for the stockholders of this company.

ADJACENT TO ANACONDA.—Review, Dec. 3: Despite the fact that this has been the dullest season Anaconda has ever experienced, there has been more development work than will lead to great future results in building up our outside interests than ever before. The mineral claims in this district have been prospected thoroughly. New ores have been discovered, and there have been constant shipments from a number of mines this year that were unknown before. Little has been said about the Blue-Eyed Nellie mine, which is our nearest big mine, but work has been steadily prosecuted in it, and we learn that they have now one of the finest ore bodies that has ever been discovered to the mine. We understand that they will soon resume their shipments to Denver. The delivery at Anaconda of ore from the Southern Cross mine has been going on steadily all summer. The shipments are going to Great Falls and Helena. At Silver Lake, there has been renewed activity this fall. The Silver Moss mine there has been bonded to Wm. Hilbert and Mr. Rhodes of Philipsburg, and they are at work on the property taking out ore. It is said that the ore that is now coming from it averages 300 ounces in silver. At Cable, work has been prosecuted all summer sinking on the flat to bedrock and tunneling to be ready early next season to place-mine a large tract. Over on Hanky creek, at the Alps properties, work is going on with unusual activity. The new mill has been started up a week and is pounding away on fine rock. The mill is a broad one of ten stamps. They are running now on ore taken from the Alps, though that of the Goldconda is of a much higher grade. In American Gulch, 20 miles southeast of Anaconda, a number of mines is being worked. At the Royal Gold mine, the mill is running right along on good ore.

NEW MEXICO.

MOGOLLONS.—Southwest Sentinel, Nov. 24: Captain L. W. Burns, a prominent mining man of the Mogollons, was in town last week and reported the outlook for that section very flattering.

AT MALONE.—Thos. Knott & Co. will rebuild their mill at Malone. The mill will be built within a short distance of the spot where Judge McComas was killed by the Indians, in 1883, and on what is known as the McComas mill site. The machinery has all been purchased and construction will be pushed as rapidly as possible. The new mill will be a complete amalgamating and concentrating mill of five stamps.

THE SILVER CORD MINE, a location in the Silver Cell belt, about 1½ miles easterly from that famous mine, is developing in a manner encouraging to its owners and promising to add another producer to the long list of such mines in this county.

JIM CROW.—Two carloads of ore will be shipped from the Jim Crow this week—one assorted, to run \$400 per ton, the other to run \$175 per ton. The ore so far milled from this property, after sorting out the high grade shipping ore, has averaged \$33 per ton. There is a practically unlimited quantity of ore on the Imperial and Jim Crow mines that will average as well. The five tons that were shipped, without sorting, from a recent strike, averaged \$70 per ton.

MOGOLLON.—Cor. Silver City Enterprise, Dec. 4: Capt. Frank Vingo has been shipping high-grade ore from the Little Fannie, during the past month, to the Grant County Mining and Milling Company at Silver City. He finds it pays better to have his ore treated there than to ship to foreign reduction works and pay exorbitant freight and smelting charges. The Last Chance mine is reported in bonanza; the miners in the middle tunnel are working in high-grade ore in the breast of the tunnel at a distance of 250 feet from the mouth, and at a depth of 150 feet from the surface. Superintendent Kimmel went East on Wednesday to meet some of the prominent stockholders; he expects to return inside of two weeks. The regular shipments of gold and silver bullion in the shape of a large brick was made on Wednesday. The bullion sells for \$1.42 per ounce.

PIÑOS ALTOS.—Bell and Stephens started their mill at Pinos Altos, on Tuesday, and let a contract to run a drift 450 feet on the Pacific extension, which will connect the 1000-foot shaft on the south end of the claim with the main shaft, which is 325 feet deep. This will develop an enormous body of ore, which, from all indications, lies be-

tween the two shafts, and throws in sight sufficient ore reserves to run their mill for a long time. In the meantime, while the Pacific is being developed, the mill will be run on ore from the Golden Rule.

OREGON.

DISCOVERY OF COAL.—Fossil Journal, Dec. 3: The town of Fossil, Gilliam county, is greatly excited over the recent discovery of a coal vein within the city limits. Geo. Mettief purchased ten acres of land, situated at the east end of town. He commenced digging a well last Friday, and on the third day struck water at a depth of 18 feet, and at 19 feet farther digging was arrested by what appeared to be solid rock. As coal croppings had been come in contact with all the way down, it was thought that, could the flinty covering be removed, coal would be revealed, and the insertion of a blast proved such to be the case. The first blast threw up coal and slate mixed, but a second attempt brought to light several chunks of absolutely pure coal. The bottom of the well is three feet in diameter, and its surface is completely covered by the ledge. The well is just one mile and a half from the tunnel which was dug into Black Butte Mountain by C. S. Miller several years ago, and is in a direct line on the same ridge.

THE VIRTUE.—Bedrock Democrat, Dec. 4: The famous old mine is to be started up. Mr. A. V. Oliver has arrived at Baker City to resume operations on the mine. He says, "While Mr. Grayson is still interested in the property, the new deal has been brought about by the organization of a strong company, composed of wealthy Oakland, California, capitalists, who have chosen me as their superintendent and manager and their purpose is to operate the mine at once." The first move will be to get a supply of wood for steam power and this Mr. Oliver has arranged for. A few days will be required to overhaul the machinery and hoisting works in the shaft house at the mine and then the work of pumping the water from the mine will be started. The pumping out of the mine will probably take about 60 days. This done and then a force of miners will be put on in the different levels taking out ore, and if the indications are as flattering as now supposed, the company will erect a new large milling plant, the old one being now in decay and entirely useless. The Virtue was discovered in 1863 by the old pioneer prospector miner and frontiersman, W. H. Rockyfellow, at the time engaged in riding the pony express from Fort Walla Walla to Idaho City, or Bannack. The organization of a strong company at this time to work the mine is the advent of a new era and is surrounded with the brightest prospects of success. In the past by actual figures the mine has yielded the enormous sum of \$1,300,000 to its owners, and there is evidence to justify the belief that there are millions yet untouched within the silent walls of this pioneer gold discovery.

UTAH.

THE DRAIN TUNNEL.—Park Record, Nov. 28: Wednesday evening at 7 o'clock a large body of water was tapped in the Ontario drain tunnel, and all work has been abandoned since, waiting for the flood to subside. The flow was so strong that all loose timbers were washed out, the planking between the track was torn out, and the air piping along the side was torn from its moorings, and is now floating in the center of the tunnel. Mr. Keetley informs the Record that about 10,000 gallons of water per minute is now flowing from the mouth of the tunnel, and that nothing can be done in the face until the water subsides. It is supposed to be simply a large pocket of water, and that three or four days will see it spend its present force and subside.

GROWS RICHER AND BETTER.—The Record was reliably informed this week that the vein has been cut on the 1500 level of the Ontario, and that the whole drift was solid ore, as rich as has ever been found in this wonderful mine. From this it would seem that the resources of the property are as yet only partly understood, and that it has a future before it that will astonish the whole civilized world. Before the vein was cut on this level, the mine, according to the testimony of the best and most careful experts in the country, had ten years' active stoping in view, but now the quantity of ore—and it is rich—is so great that the company can figure on at least double the life of the mine and the camp, to say nothing of any new developments that may in future be made. The world at large does not comprehend the immensity of the great Ontario, even when it is admitted to be the greatest silver mine in the universe. Think of the wealth it has added to Utah, to the various industries throughout the country and given to its stockholders. It is a wonderful property, and Park City is proud of it.

ALLIANCE TUNNEL.—Park Record, Dec. 5: Monday night last the entire force in the Alliance tunnel was laid off for the winter, and the big enterprise in which so many thousands of dollars have been spent to locate the ore body is now idle and silent. Mr. Norman, the foreman, informed the Record man that while the lower tunnel would be closed for the winter, active developments would be prosecuted to advantage, as the big tunnel makes a fair drain. There is much good ore in the upper levels of the Alliance, and it will be stope out and sent to market.

ORE AND BULLION.—The Ontario mill shipped 36 bars of bullion this week, containing 22,471.78 fine ounces of silver. For the week just ended there were received at and forwarded from the Mackintosh sampler 498,490 pounds of Ontario ore; Daly, 373,170; Mayflower, 399,170; Anchor concentrates, 375,850; Mayflower concentrates, 25,270; total, 1,110,950 pounds.

LA PLATA.—The Park City men who are interested at La Plata feel very much encouraged over their outlook for big mines in the near future. They are doing considerable solid development work in that camp. Frank Thackwell arrived in the Park from La Plata Thursday night and returned again this morning. The more he sees of that camp, the better he likes it. He reports the weather there about the same as it is in the Park, with about the same quantity of snow. Quite a number of men are now employed in the camp, and it will have a boom next summer sure.

MR. W. T. DEWEY and Miss Aona Wedel of this city were married on the 25th ult. Their many friends extend congratulations.

MECHANICAL PROGRESS.

American and English Workshops.

At a recent meeting of the Manchester Association of English Engineers, Mr. Hans Renold read a paper on "Some Leading American Workshops." Mr. Renold gave his impressions of a few of the leading American workshops which he visited during the recent visit of that association to this country. The paper was quite complimentary to the shops on this side of the Atlantic, and very favorable comparisons made. Among the shops more carefully described were those of Messrs. Brown & Sharpe, Providence, R. I. Mr. Renold, who is evidently an enthusiastic admirer of the American mechanic, laid particular stress upon the manner in which mechanics are treated in this country as compared to the treatment they receive and the estimation in which they are held in England. He took occasion, however, to enforce upon his audience the idea that his opinions, when derogatory to English workmanship compared with that across the Atlantic, were based on an inspection of the best American shops; but even with this proviso, he was greatly struck with the skill, the touch and the understanding of the American workmen.

A reason for this being found in the specialization of the machine trade in America. In the States many firms were found making one thing, and one alone, to an extent of which it was hard for the English mind to conceive. By this means they were enabled to give their exclusive attention to the perfecting of special tools and appliances, by which the cost of production was reduced to a most remarkable degree.

In illustrating this idea, he made special reference to a shop which he visited in Boston, where he saw patent milling cutters being made at the rate of 64 per hour by a dozen men, \$5 spent in wages producing \$150 to \$200 worth of goods.

In the course of his remarks, Mr. Renold paid well deserved compliments to some of our journals devoted to mechanical industries, alluding in a special manner to the practical character of their contents.

As it was evident Mr. Renold had much more to say, an adjournment was voted until the next day to listen to his concluding remarks, and it was furthermore intimated that, as some of his hearers were not in full sympathy with his opinions, they would not be suffered to pass altogether unchallenged.

OLD AND MODERN WAYS OF STEAM HEATING. An article is going the rounds to the effect that the use of steam for heating purposes far antedates the time when James Watt conceived the utilization of it for power. As long ago as the days when Pompeii flourished in its original splendor, steam was used for the purpose of heating buildings, for subsequent excavations have brought to light indisputable evidence of its use. A profitable hint might in some cases be taken from the architects and engineers of those days, who held that the "true and reliable" way to utilize this convenient mode of heating was to build in the partitions of the houses hollow passage-ways, into which the steam was supplied, when by radiation solely the desired heat was transmitted to the apartments to be warmed. With the introduction of pipe it was found more convenient and economical to convey the steam to hollow receptacles, which were set in the different rooms to be heated. The joints in the pipe in those days were made tight by the use of yarn packing, and it is a matter of great surprise to the enlightened American that even to-day this mode of connecting pipes is largely used in England. The Englishman takes slowly to the idea of threading pipes and connecting them by the use of a little red lead. Following along the line of advancement we find that wrought iron pipes are now largely supplanted by cast and ornamental radiators. It is found that greater possibilities of ornamental design are to be had by the use of cast iron, and again cast iron, being homogeneous, gives off heat with greater freedom, representing a superiority over wrought iron as a radiator of from 13 to 25 per cent. Wrought iron conducts heat; cast iron radiates it; wrought iron is a fibrous structure, cast iron a homogeneous one; and so where heat is to be imparted and not stored, cast iron is more desirable to use.—*The American Engineer.*

MANUFACTURE OF STEEL AND INGOT IRON.—Mr. R. S. Casson of Round Oak Iron Works, Brierley Hill, Staffordshire, has devised some improvements in the manufacture of steel and ingot iron, the object being to provide improved means for carburizing the molten metal so that the amount of carbon in the resulting metal may be more or less accurately determined. To this end he introduces the carbon (preferably in the form of charcoal) into the casting ladle, and then taps the metal direct from the converter or furnace into the ladle, after adding any desired quantity of ferro-manganese or other material. In this way a high percentage of carbon can be readily introduced into the metal and a high grade of steel produced. In practice, for producing a high-grade steel capable of standing from 26 to 34 tons tensile strain, Mr. Casson proposes the use of about 5 pounds weight of finely ground charcoal per ton of metal, and also to increase some-

what the normal percentage of ferro-manganese. Other forms of carbon than wood charcoal may be employed so long as they do not contain such a high percentage of sulphur or other ingredients as would be injurious to the resultant steel.—*The Mechanical World, London.*

A NEW USE FOR OLD STEEL RAILS.—We have already alluded to the use which has recently been made of old railroad iron instead of wood for "timbering" mines. But it seems that our English cousins are making a still wider use of this constantly increasing amount of old rails. The Birmingham Trade Circular calls attention to a recent English patent by which old rails are prepared for a more general use, as follows: For steel rail pipe and framework for collieries, mines, shafts, tunnels, aqueducts, bridges, jetties, gantries, culverts, sewers, flues, cattle-creeper, cellaring, supports, etc. The objects of the invention are to utilize old or defective rails, both of which are equally serviceable with new rails, and to provide props and other supports of great strength and security, which, from their material, are practically imperishable, and will also be eventually cheaper than any form of mining supports. Mr. Barnes has made use of iron and steel rails, which are cut into suitable lengths, and by slots or notches at the ends are shaped so that they can be easily framed together. The journal we are quoting from is informed that the Whitehaven Colliery Company is testing several main road sets, and that they have stood unaltered in position under the greatest possible pressure and strain, and the sole struts have effectively prevented the heaving or rising of the floors. The company speaks highly of the systems, and intends extensively adopting them at all its pits.

IMPROVEMENT IN PUDDLED IRON.—Some improvement in the manufacture of puddled iron has been patented by Mr. J. A. Crawford of Church street, Walker-on-Tyne. It is not often nowadays that much attention is paid to introducing anything new in the puddling process, as owing to the advances made by steel, and the extent to which iron has been driven out of the market by it, puddling iron has been looked upon as a dying industry. Mr. Crawford, in manufacturing malleable and gun iron by the hand-puddling process, proposes to melt the pig iron to be used in a cupola with a small amount of scrap, and on the iron becoming liquid, it is conveyed to the puddling furnace, and allowed to remain there until it has reached the standard heat. If scrap is scarce, manganese may be added to the liquid iron after leaving the cupola. It is claimed that the output per puddling furnace is much increased.—*Glasgow Engineer.*

AN EXPERIMENT.—According to the *American Machinist*, one of the great street railway systems of Chicago is to experiment with steam locomotives brought from France. Of course, says the *Machinist*, this road could get all the locomotives required for this purpose in this country, but if those made in France are better for the purpose, then it is a good thing to find it out. There have been already a good many efforts in this country to use steam and compressed-air locomotives, but, generally speaking, these efforts have not been successful. If some one in Paris can furnish us with what is needed for the purpose, we hope he will find ample sale for what he makes, even though Yankee pride gets a shock. No matter what improvements may be discovered in the foreign make of any special machine, Yankee inventors will soon, after giving them a thorough, practical trial, thoroughly Americanize them by still further improvements.

STEEL CARS.—Steel cars are proving a success. Ten of them, the property of the Calumet and Blue Island railroad, of Illinois, have been in freight service for several months past, and have given excellent satisfaction. They are in the coke trade, and enter the Connelleville region over the Pittsburgh and Lake Erie. A representative of the company using them recently eulogized them very highly, and said they were standing the wear and tear well. In many respects he thinks they are superior to all wood cars, as there are no especially weak parts about them. Steel cars must soon come into general use for both freight and passenger service. In the latter use they would be much less destructive to human life and limbs than wooden cars, which generally get in their destructive work by means of splinters, broken timbers and fire. Steel cars will not break up nor take fire.

PLATINUM.—The price of that valuable and scarce metal, platinum, has been on the decline during the past year, and is now about one-half what it was one year ago. The crude product has, however, recently commenced to advance in value, and some anxiety is felt by consumers, who fear that it will again rapidly take an upward course and reach the high figures of one year ago. This metal enters very largely into the construction of incandescent lamps and all good contact points, and its increase in price would be felt quite largely throughout the electrical industry.

THE WORLD'S WORK.—Some one has very truly said that the world's work is not done by corner lot speculators, but by those who, by their individual efforts, create value of some kind, and the feeling is becoming general that their burdens should be lightened somewhat.

SCIENTIFIC PROGRESS.

The Next Advance in Telescope-Making.

Why, asks the *Pall Mall Budget*, is it so difficult and expensive to construct an immense telescope? From the time of Galileo to that of Clark, steady work has been done, and each step has given us a larger object-glass. The pupil of the eye is one-fifth of an inch in diameter, and can grasp but a limited amount of light. A 25-inch object-glass will enable the eye to take in over 15,000 times more light, and with such a glass the moon can be seen as though it were only 80 miles away; but if the size of the object-glass could be further increased, the moon would be brought considerably nearer. To make a large object-glass is the difficulty, and it is only after years of patient work of the most skilled men on earth, and after repeated attempts, that one can be produced which is accurate. Slight differences of specific gravity, changes of structure due to jarring, strains resulting from unequal pressure and changes of temperature, are all capable of ruining the work.

A New Field for Electricity.

Some one who is anxious to anticipate events has asked: Why not replace the glass, which is only a medium transmitting light at a different velocity from air, by a properly constructed electric field? It is conceivable that an electric field 50 feet in diameter could be arranged. Just what the nature of this field should be, with our present knowledge, we cannot say, but some day it will be known, and then the secrets of the other planets will be ours. Ether (says a technical paper) is now paramount with experimentalists; some day it will form the basis of all electrical text-books. We seem to be on the verge of discovering something really great in the world of ether. The early experiments of Faraday, the marvelous mathematical researches of Maxwell, and the crowning experiments of Hertz, all show the intimate relations which exist between electricity and light. They have so entirely changed our views of science that it has been truly said that electricity has annexed the whole domain of optics.

Unconscious Influence.

When so much is said by moralists about exerting a good or bad influence, that which the individual is directly conscious of is usually meant. Yet it can scarcely be doubted that the influence unconsciously emanating from every life is more important than its owner knows, or can begin to understand until the wider vision of the larger future life makes plain much that is doubtful and obscure in this. How little of what we know of the effect of our unconscious influence may be guessed in our ignorance of the causes that have combined in ways we cannot now see to make us what we are. No one who has lived past middle life will refuse to acknowledge that much the greater part of the influences that have determined his course in life were foreordained for him before his birth. Parentage, ancestry, even to the third and fourth generation, affect character so that it may be beyond the influence that can be brought to bear on the individual life.

No one knows or can know the extent to which unconscious influence operates. In this life, slight and seemingly unimportant incidents bear fruit that astounds those who first influenced it. Yet, in the main, the actions of the present life bear their fruit in the greater hereafter. Herein lies the greatest incentive to right living. Whoever has influenced men or women for good, that influence extends through life. It is equally so wherever the influence has been for evil.

Some years before his death, Daniel Webster, the greatest statesman this country has ever produced, was asked what had been the greatest thought of his life. With more than usual solemnity, he replied: "It is that of my personal responsibility for what I do in this life to my Creator." It requires an intellect like that of Webster to think such a thought as this.

To how many men, this thought, appreciated as it should be, must be overwhelming. If their lives have been wholly evil, that evil must go on in other lives through successive generations. But there is a brighter view of human future than this. No life is wholly evil, and the good influences which men exert, unnoticed perhaps at the time, enlarge until the good overcomes the evil. It is, in the long run, the good which survives, and the evil that is overcome and perishes. Only thus could the good finally be triumphant, as the seeds and prophecies in all ages have believed it will be.—*Selected.*

WHY SHIPS ARE NOT STRUCK BY LIGHTNING.—For some time past it has been remarked that ships at sea are far less often damaged by lightning now than was the case when wooden ships were so much in vogue. This has been noticed even under the tropics, where violent storms are very frequent. According to some returns made of the statistics that have been accumulated since 1879 by the German authorities, this must be attributed to the general use that is now made of wire rope for rigging purposes, as well as to the fact that the hulls of ships are usually constructed of iron or steel. Thus the whole ship forms an excellent and continuous conductor, by

means of which the electricity is led away into the ocean before it has time to do any, or serious, damage. Captain Dinklap, who has had charge of the commission appointed to investigate this question, states that no case has been recorded where a ship rigged with wire rigging has sustained any damage from lightning, except in a few instances where continuous connection had not been made with the hull. But wooden ships rigged with ordinary rope rigging still showed the same percentage of casualties as formerly, when they are not fitted with lightning rods, and when the proper precautions are not taken to maintain their efficiency.—*Electrical Review.*

PHOSPHORESCENCE.—M. Henri Becquerel has recently studied the different manifestations of the phosphorescence of materials under the influence of light and heat, and has communicated some observations upon the subject to the Académie des Sciences. The result of M. Becquerel's experiments up to the present time is to place the phenomenon of phosphorescence induced by heat (hitherto considered as distinct from all other phenomena of the kind) once more into the class of known and studied phosphorescence effects. One fact in particular deserves attention in connection with this subject—the conservation to an indefinite time in certain bodies of a portion of the energy which they have absorbed, and which they emit upon being heated. M. Becquerel asks by what mechanism this energy is thus maintained in its potentiality without appreciable loss. He declares himself unable for the present to answer this question but he looks to future research for information upon the subject, which may have the most important bearing upon the state of knowledge of the mechanism of light radiation and the storing of energy in its highest and most intense forms.—*Electrician.*

DIVERGENCE IN NORMAL ATMOSPHERE.—M. Lancaster has recently indicated in *Ciel et Terre* the divergences from normal temperature in Europe in the five years 1886-90. It appears (and is shown in a map) that the centre of the "islands of cold" lies over the north of France, the south of Belgium, and the most western parts of Germany. From this centre the cold decreases pretty regularly outwards on all sides to a nearly circular line of *nil* divergence, which, embracing the whole of Great Britain, crosses the South of Sweden, then goes along the German Russian frontier, through Hungary, the south of Italy, the north of Africa, and across Spain. Throughout this enclosed region abnormally low temperatures have prevailed. Siberia, too, shows thermal depression, which M. Lancaster thinks may be connected with that in Western Europe.—*Nature.*

PROGRESS IN PHOTOGRAPHY.—As an instance of the great progress that has been made in the methods by which rapid movements can be analyzed, the *Photographic News* mentions a series of photographs lately taken by Anschutz of Liège, who has already given to the world some of the best instantaneous pictures ever taken. The subject of the pictures at present under consideration is a dog jumping over a small bush. In the act of making one jump, the animal has been photographed 24 separate times, and each picture is not a mere silhouette, as was the case with Maybridge's first attempts of this kind, but a little picture showing half tone and detail.

ASTRONOMICAL VEHICLES.—Dr. Elkin, the astronomer of Yale University, and formerly of the Cape of Good Hope, has, by a long series of observations on the parallax of the Star Arcturus, arrived at the conclusion that it moves with the inconceivable velocity of 381 miles a second—that is to say, it would traverse the distance from London to Edinburgh between two ticks of a watch. This is 21 times faster than the speed of the earth in its orbit round the sun. Dr. Elkin also finds that Arcturus is so far away from us that his light, traveling 190,000 miles a second, takes 181 years to reach us.

THE AROMA OF WINE.—At a recent meeting of the Paris Academy of Sciences, M. Rommler read a paper on the yeast of wine—the bouquet, or aroma, of the wine made from grapes of the same species but grown in different districts being quite distinct. The characteristic bouquet seems to be due to the district, and wine from elevated vines or outcrops does not necessarily possess the special flavor of the original when planted in other districts. It is well known that the best wines are produced from grapes raised on volcanic soils.

PLOWING WITH DYNAMITE is the novel suggestion by Mr. D. U. Sloan of Atlanta, Ga. His purpose is to break up the soil to a depth of two or three feet, as is done by the expensive trenching method. His plan is to drill 1600 holes to the acre, two to three feet deep, and to put a small amount of explosive in each hole, and fire them by electricity or otherwise. He has tried the experiment and says it will not cost more than \$25 per acre, and thoroughly break and pulverize the ground.

UP FROM THE DEPTHS.—A somewhat singular artesian well in Missouri is throwing up all sorts of things, among which pyrites and quartz of various kinds have been found. There are also numerous specimens of petrified wood, fire opals, shells of various kinds, and other interesting articles.

ELECTRICITY.

Rapid Progress of Electric Railways.

There is nothing in the history of industrial or educational progress, which has illustrated more emphatically or more clearly the value of the "press," as a general educator of the people or a helper in material progress, than the part it has played in the wonderful advance which electricity has made during the last few years. Whatever is new in science or industry, is taken up at once by the intelligent press, and, with the speed of lightning, carried and proclaimed in every portion of the civilized world. A widespread interest is thus set up, which urges on busy brains everywhere, to study, to plan and to invent new methods and new processes for the accomplishment of possibilities pointed out, by which money-getting may be facilitated, pleasure more readily secured or science and industry more rapidly advanced.

Not more than 12 years have elapsed since the first crude suggestions were made in regard to the possibility of running cars and trains by electricity; and only four years ago, according to Prof. F. J. Sprague, in the September *Forum*, the number of electric roads in successful operation could be counted upon one's fingers. At that date of writing, the professor estimated that there were then in successful operation or under contract not less than 350 roads in the United States and Europe, not counting those in Austria or Japan. These roads embrace not less than 2600 miles of track; 7000 cars and 4000 motors. They make a daily mileage of about 500,000 miles and carry fully one thousand million of passengers annually. They give employment to fully 10,000 people, and are credited with a less proportion of accidents than any mode of locomotion known. Over \$50,000,000 are invested in this industry in the United States alone, not including the further enormous sum of investments and employees engaged in the business of constructing electric cars, motors and other appliances, indispensable to this enormous business. Since the article in the *Forum* was written, the progress has been even still more rapid, as will be seen by the address, an extract from which is given below.

Is there any one who would venture the assertion that one-fifth part of this progress could possibly have been realized without the aid of the daily and weekly press in collecting, collating and disseminating the vast amount of information which has been required to bring about these grand results? Books would not have accomplished as much in a lifetime. It is to intelligent, live and progressive journalism that the world is chiefly indebted for the rapid strides—rapid far beyond all precedent—which have been made during the last 40 years, in every department of industry, science and thought.

America Leads the World.

President Watson, in an address delivered at the recent meeting of the American Street Railway Association, said: "It is a source of no little satisfaction to us to know that, in the development of the electric railway, America leads the world. Three years ago, there were only 13 electrical roads in the United States; now there are over 400, and the advances from every part of the country indicate that before the close of the present year the number will be increased to 500. The capital now invested in American electric railways exceeds \$75,000,000. 'Horse sense' counts for but little in this age of rapid transit. We old dogs have been obliged to learn new tricks, and without the usual privilege of serving an apprenticeship. Our stables are being converted into power houses; the electrician has taken the place of the veterinary surgeon; our drivers are being educated as motor men, and most of us have horse-cars for sale."

Our cities and large towns are becoming bunnies for street railways, and chiefly electric railways, as the bulletins of the present census bureau show that in 54 of the largest American cities the mileage was nearly doubled between 1880 and 1889—the exact figures being 1983 miles in '80 and 3150 miles in '89.

In this connection it is interesting to note that the number of horses employed on street railways has fallen off since November 1890, from 116,795 to 83,114—a decrease in one year of 28,681. At this rate it will not take long to entirely emancipate the horse from the slavery of street railway drudgery.

The Practicability of Electric Roads.

The foregoing remarks refer almost exclusively to street railroads; but there is good reason to believe that electricity will soon be economically applied even to our transcontinental roads.

The recent interview of a New York paper with Mr. Edison, in which he was reported to have expressed himself most enthusiastically in regard to the application of electricity to railroads in general, has been received with much incredulity by many of our contemporaries; but Mr. Villard, who has been closely connected with Mr. Edison in his recent experiments in this direction, since his arrival on this coast has fully confirmed the reality of those interviews, substantially as they have already been given in these columns.

Henry Villard is one of the brightest men in the railroad business. His opportunities for thoroughly looking into Mr. Edison's experi-

ments have been as full and free as could possibly be had, and when he says, as he has said, that trains on the Northern Pacific will, before long be operated by electricity, we have good reason to believe that he knows just what he is talking about.

Mr. Villard is president of the Edison Electric Co., and with Carl Schurz and others, represents a vast amount of German capital which has been invested in many of our important electric enterprises, under the name of the North American Company. He asserts that this company is already introducing electricity on some of their roads. The St. Paul and Minneapolis is one of their roads, which is really a belt road 20 miles in length—twice the distance between the two cities as the road runs. This road has only been running a short time, but already we hear that several trains which have been operating between those two cities on steam roads have been taken off owing to lack of patronage and extra cost of operation. People prefer to travel on electric roads. They are cleaner, less noisy and more speedy.

Mr. Villard says: "I have applications for over 20 different inventions for long-distance electric transportation. There is no doubt in my mind that overland trains will ere long be run by electric power. The question will be solved, I think, by having separate motors under each car. The difficulty now is that an electric locomotive is not heavy enough to produce sufficient traction to pull a long train."

This objection is to be obviated by running short trains, or by distributing several motors along the length of the train. This is perfectly practicable and economical. An electric motor will only pull three cars. It lacks weight, hence traction, to pull a long train. A locomotive has to exert 350-horse power to move a long train. It must have weight to do that work, which causes a large amount of wear and tear on the rail and a much heavier and more costly rail to bear up under it.

Mr. Villard further says: "The possibilities of electricity are quite undeveloped yet, and when the motors are distributed along the train, I think that the days of steam engines will be numbered. I believe that Edison's latest electric car invention is on this principle."

Electricity on the rail will save expense in construction of both rail and motor. It will also make an immense saving in coal, for the reason that it does not take more than one-fourth the coal to run a stationary engine that is required to run a locomotive of the same horse power. Stationary engines of course will be employed to generate the electricity for railroads until we are able to obtain it directly from coal. Water power can be used for generating electricity wherever it may be convenient—say for distances of 25 or 30 miles.

THE FRESNO ELECTRIC RAILROAD ENTERPRISE is fast becoming materialized. The road will reach out in every direction to the colonies which are growing up all around that city. The enterprise is one of much importance, and means a great deal for Fresno and the country immediately around it. It means that all parts of the city will have lines connecting with the business portion of the place and outside settlements, and that transit will be safe and rapid. The incorporators of the company are Dr. Lewis Leach, J. B. White, Fulton G. Berry, Marcus Polasky, Morris Messenger and W. F. Candler. The *Expositor* says: Just when the first step will be taken in pushing the new plan forward to completion cannot now be stated, as the plans are not yet fully matured. But it is understood that something will be done before very long, and that the necessary capital is at hand to carry out the enterprise. The sum of \$1,000,000 is the estimated cost of pushing the new system to completion. Of course, such a sum as this would not be necessary, if it were not the purpose to have everything not only up to the latest inventions, but also in the very best manner. All that is known of electric systems will be put in practice here, and what other cities have tried and found good will be taken into this system here. It means much for the future.

SILK WEAVING BY ELECTRICITY.—An interesting trial has been made in Germany with silk weavers looms worked by electricity. Two looms were put in motion, the result being that the working by electricity was more satisfactory than that by means of ordinary engines or gas motors, and the weaving masses, otherwise necessary for the working on a small scale, can be entirely dispensed with. The German papers think the results named show that house industry could easily be made to flourish by the transmission of electric power.

A BRIDGE CHARGED WITH ELECTRICITY.—After a few days travel over it by electric cars, the great iron and steel bridge over the Tennessee river at Chattanooga, built by the county at a cost of \$225,000, was found to be charged with electricity, several persons receiving slight shocks. Recently the trolley wire was cut by the car company, and the danger is thought to be over.

ELECTRICAL SCIENCE.—Prof. Elisba Gray remarks that electrical science has made a greater advance in the last 20 years than in all the 6000 historic years preceding. More is discovered in one day now than in 1000 years formerly.

USEFUL INFORMATION.

A Substitute for Glass.

Various devices have, from time to time, been introduced as substitutes for glass, but the following bids fair to prove more than a mere temporary or flimsy substitute:

A glass manufacturer of Vienna, Austria, claims that he has produced a new substitute for glass. In an account of his invention, he says: "I dissolve from four to eight parts of collodion wool in about 100 parts by weight, of ether, or alcohol, or acetic ether, and with this I intimately combine from two to four per cent of castor-oil or other non-resinous oil, and four to ten per cent of resin or Canada balsam (soft resin). The compound when poured upon a glass plate and subjected to the drying action of a current of air of about 50° Centigrade, solidifies in a comparatively short time into a transparent glass-like sheet or plate, the thickness of which may be regulated as required. The sheet or plate so obtained has substantially the same properties as glass, as it will resist the action of acids and alkalis and of dilute acids, and, like glass, is transparent and has no smell. On the other hand, it has the advantage of being pliable or flexible and infrangible to a great degree, while its inflammability is much less than that of the collodion substitutes. The compound, as will be readily comprehended, is of such a nature that any desired color or shade of color may be imparted to it by the admixture of the necessary pigment. The pigments should be soluble in the solvent used in the preparation of the compound, if incorporated therewith; but the color may be imparted to the substance by surface application, aniline dyes or colors being employed, so that the sheets or plates may be used in lieu of stained glass. The material may also be ornamented by printing any desired design thereon."

BUTTONS constitute a very large as well as useful, not to say indispensable industry. The demand for them is rapidly increasing, especially since the gentler sex is making so large a use of them, larger in fact than that demanded by the other half of mankind. Just now, metallic buttons are in the greatest demand, perhaps, but there are others that are rated as almost equally good sellers. The large duty on pearl buttons has compelled the introduction of this industry into this country, and several quite extensive factories in New York and Philadelphia are now in successful operation; while the one in Chicago has not yet started, it will soon be in a position to turn out goods. The demand for pearl buttons, while not quite as large as formerly, does not appear to largely diminish. For men's clothing the hard rubber button retains its popularity. They come in regulation sizes, no special novelties being often offered. The metal buttons, other than aluminum, are in bronze, copper and gold. They are all imported goods and of the cheaper qualities. The jet buttons are always popular. They are all made in Bohemia. Jet, however, is a misnomer, as they are only a black glass. The price depends upon the cutting of the goods more than on the sizes. The pressed range lowest in price. Where there is only a top cut the price is also comparatively cheap, but the ascent commences as the cut facets increase. Silk buttons, in all shades, to match the tailor made dresses, are just now great sellers. They are home made. The agate buttons have a field of their own from which they never waver. They are used on certain classes of underwear, prints, etc. There is really only one house, and that in France, that makes good agate buttons, which do not break upon the slightest provocation. The German imitations are nearly all more or less faulty in this respect.

INFRINGING ON AN ANCIENT IDEA.—"There is no new thing under the sun." Messrs. Robinson of Long Acre, in the course of their business of supplying artists with pigments, become possessed, from time to time of remains of the great Egyptians, to be in due course ground up by them, and sold in tubes as "mammy" paint. The firm recently lent a piece of the beautifully woven and preserved linen bandages, in which a high priest and keeper of the baths had been preserved, to be shown at some convocation or lecture in the Midlands. The texture and quality excited great admiration among the audience, which culminated in something like astonishment upon the declaration of a manufacturer that this fabric, woven, perhaps, by a contemporary of Moses, contained the same disposition of threads which he had independently invented and patented only a year ago.—*Pall Mall*

AN INTERESTING TABLE COMPANY.—An exchange says: "Around a table in the cafe of the Chicago Club are to be found every day at lunch, Marshall Field, with a fortune of \$40,000,000; George M. Pullman, \$25,000,000; P. D. Armour, \$20,000,000; L. Z. Leiter, \$20,000,000; Potter Palmer, \$10,000,000, and N. K. Fairbanks, \$5,000,000. Field, Leiter and Palmer began life as clerks in dry goods stores, and Pullman as a railroad conductor. Armour and Fairbanks did not start at the bottom of the ladder."

BREAD FROM SAWDUST.—Experiments are in progress, under the auspices of the Agricultural Department, looking to the manufacture of bread from sawdust. The chemical constituents are identical.

SHOP NOTES.

Something About Pulleys.

Much is being said of late about pulleys. It is the object of every proposed improvement to get the most work out of them with the least application of power. The chief source of loss arises from slipping, and various devices have been designed to remedy this evil. Covering iron pulleys with paper is sometimes resorted to, the method consisting in first rendering the pulley absolutely free from grease by means of sal soda, scrubbing the whole surface with a file, wetting with dilute nitric acid for a few minutes to deaden the scratches, then cleaning with water and drying; following this, the paper is applied by winding the strongest gline, or it may be wetted with tannic acid and applied as above. Some prefer to add a tablespoonful of glycerine to a quart of gline and then apply hot. The edges are turned off and a coating of common shellac applied. One of the latest devices consists in the employment of a specially prepared leather covering which is extremely soft and elastic and never glazes by the rubbing action of the belt, as is the case when ordinary leather is employed for the purpose. It is applied to the pulley and held firmly to it for all time by means of a special cement, made so as to be soft and to remain so; unlike ordinary cement or glue, no rivets of any kind being used, as the leather covering is firmly attached to the iron of the pulley by the cement alone. It is claimed that by this device 40 to 50 per cent more power can be transmitted than by ordinarily prepared pulleys, while slipping is reduced to an imperceptible factor. The claim is rather an extravagant one; but if the covering can be kept free from glazing and reasonably elastic it will no doubt prove of considerable value.

Loose Pulleys—Oiling.

An exchange says that there is really no necessity for a loose pulley becoming a nuisance, provided it is properly constructed in the first place and well taken care of afterward. One of the principal faults in construction is imperfect balancing and the manner in which the oil is applied to the shaft. Frequently the loose pulley with a light hub, is provided with no other facilities for oiling except a hole drilled through the hub—perhaps not more than one-fourth of an inch in diameter—with no other provision made for either retaining the oil or excluding the dust. A wooden plug is sometimes inserted, and while this may answer a good purpose for excluding the dust, is necessarily of such a length that when forced in the oil hole the greater portion of the oil that has been applied is forced out, so that only a few drops are left to answer any useful purpose; and while a small space on each side of the oil hole may be lubricated, the ends will often be found dry and cutting. With such pulleys, no matter how careful the operator may be, it will only be a question of a short time when they will begin to rattle and become a general nuisance.

"Let Her Run."

There are some shop bosses who will allow a belt to be put on and allowed to run at will, with very little attention to either pulley or belt. The lubrication of the pulley may be neglected and the belt may also be suffered to become dry. Such persons ignore the fact that pulleys and belts need care and attention as well as any part of the machine itself. They are indifferent to the fact that a belt will become dry and hard by neglect—that accumulated dust and dirt will destroy the life of the best leather, render it hard and smooth and liable to slip and waste power. A wise man will look after all these little things and save money for himself or his employer. He won't simply put a belt on and "let her run" without further care.

THE LONGEST SHAVING.—In the machine shop attached to the armor-plate department of the Homestead Steel Works, where are made the great steel bolts to fasten the plates to the vessels, there occurred the most unusual thing recently. A bolt was being turned on one of the lathes, and the workman operating it turned off a shaving 265 feet long. This is without doubt the longest shaving turned on a lathe in the world, and speaks volumes for the quality of steel made at Homestead. Some years ago, at the Woolwich Arsenal, England, a shaving was turned off a gun measuring 171 feet, and is exhibited there as a great curiosity. The Homestead shaving will be made into a Turk's head and placed in the civil department of the works. It will also be well worthy of a place in the approaching Columbian Exposition.

HAND OR MACHINE RIVETING.—It is generally believed that hand riveting is stronger and more reliable than machine riveting, but recent investigations seem to point the other way, at least we infer such to be the case if we consider the statements and examine carefully the illustrations shown at a lecture recently delivered before the Franklin Institute by Mr. Barnett Le Van.

THE MAMMOTH CORE SAW, built at Tanton, Mass., and intended for boring out barrels from solid logs, to which allusion has already been made in these columns, is already in successful operation in or near Laoroese.



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SAN FRANCISCO:

Saturday, December 12, 1891.

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[NEW THIS ISSUE.]

Concentrating Machinery—California Manufacturing Co. Books—Henry Carey Baird & Co., Philadelphia, Pa. Gold Mine for Sale—G. W. Munroe, Glencoe.

See Advertising Columns.

Passing Events.

We publish in this number of the PRESS the address of the miners of Placer county to the citizens of California upon the occasion of calling a State Miners' Convention. It will repay perusal by all who desire the industrial advancement of California. The miners desire to bring the attention of Congress to certain things detrimental to the industry, and for this reason representatives of the different counties will meet in San Francisco January 20th.

Another example of failure of a mining project by putting up works before a mine was found is chronicled in Siskiyou county, where the furnaces erected have not quicksilver ore enough to keep them running. They have had to shut down while ore is hunted for.

Comstock mining and milling systems are under discussion just now, and the facts brought out in the Hale and Norcross suit are not very encouraging to people who invest in mining securities. The directors apparently did not direct to any great extent, and those people in a position to make money handling the ores seem to have had pretty much their own way. Of course no mine could pay under such a system.

The Miners' Address.

The address of the Miners' Association of Placer Co. to the people of California sums up, as briefly as may be, certain grievances which it is desired Congress shall give heed to, with a view of encouraging, instead of as now, discouraging the mining industry. What the nature of these are is set forth in the address. The restricted interpretations of the statutes relating to mining, by the Departments and Courts, have thrown many obstacles in the way of obtaining title to mining claims. Large tracts of land are passing from the mineral domain into holdings of corporations or individuals, a course evidently not intended by Congress, but made possible by the rulings and decisions which have taken the place of the plain law.

As to the hydraulic question, that much discussed subject, the miners want Congress to carry out the recommendations of the Government Engineers, who were appointed specially to report on the matter. They say that dams can be built to restrain the heavier debris, and that the lighter can be cared for by the rivers themselves, when properly improved. Under these recommendations, some of the hydraulic mines would again be worked without injury to other interests; the miners want Congress to order some of these dams built, and order them so that a local court cannot interfere.

The rights of mining exploration, occupation and purchase want to be more exactly determined by Congress than at present, so people cannot obtain mining ground except under the mining laws.

The address is plain in its language and urgent in its tone. That it will call the attention of the public to the mining situation is evident.

Impressions of the Mining Congress.

Mr. Almarin B. Paul made us a call during his stay in the city this week, and from him we gathered some points as to the "Mining Congress" held at Denver, Colo., last month.

Mr. Paul considers the meeting a great success, mainly from the fact that every mining State and Territory was represented, and with but few exceptions, every State in the Union, which showed conclusively how widespread is the interest in mining.

The intellectual status of the body of delegates, numbering nearly 600, he said could not be surpassed by any gathering of an equal number of men. He considers it a great mistake, however, that so little attention was given to other mining subjects of equally vital importance with silver—to wit, railroad land claims and hydraulic mining especially. The silver question alone absorbed all the time until within the last hour of adjournment.

Mr. Paul speaks highly of the enterprise of the citizens of Denver, and Colorado as a prosperous State, and says in comparison, California is asleep. He illustrates it by stating that 80 trains a day leave Denver, and that during his stay there, as high as 1020 carloads of freight came there in a single day and as high as 1250 tons of high-grade gold, silver and lead ores for the smelters in a single day.

Colorado, with a population of about 400,000, produces \$30,000,000 in her metals, while California, with three times the population, produces not over half as much. Mr. Paul is pleased with the idea of a Miners' State Convention, as he thinks a State organization needed, and will accomplish much good.

SUMMER SCHOOL OF CHEMISTRY.—At the suggestion of Prof. Rising, the Board of Regents of the University of California has established a summer school of chemistry, to be held at Berkeley during the long vacation of next year. In favoring the proposition, Regent Stebbins declared that it was a phase of University extension, and would give opportunity to many teachers to receive free instruction in a subject in which they teach. An endorsement of the same general subject was made by the board in granting Instructor Ritter permission to take a number of valuable instruments away from the University for use. He will take his students in biology to the seacoast for original investigation during the summer months.

THE Salton sea, in the Colorado desert, is drying up rapidly.

Comstock Mine Management.

The suit of Mr. W. Fox against the Directors of the Hale and Norcross Mining Co. continues to develop interest for all classes as the testimony elicited unravels and throws out in bold relief the peculiar methods employed in the milling of ore.

Part of Thursday of last week was occupied by Attorney Biggett in reading the deposition of T. R. Hofer, cashier of the Bullion Exchange Bank at Carson. This deposition, which was admitted as evidence, is mainly valuable owing to its tracing several checks that were deposited with the bank. Mr. Hofer, by advice of his counsel, refused to answer many important questions. The point of Mr. Hofer's testimony lies in the fact that the Mint records introduced in evidence last week show a list of unstamped bars deposited by C. H. Peters, the clerk of the Bullion Bank, for parties unknown, and the records of Wells, Fargo & Co.'s agent at Gold Hill, also in evidence, show the receipt of these bars.

The depositions of the two clerks—C. H. Peters and H. P. Brown—of the Bullion Bank, showed that they refused to give any information whatever as to the deposit of bullion in their names, or whether they had any interest in them. "At the time these interrogations were propounded, Peters had over \$1,000,000 to his credit at the Mint," said Mr. Biggett.

In the afternoon, John W. Mackey was called as a mining expert by plaintiff. He said that he was engaged in business of all kinds, principally mining and telegraphy. Owing to Mr. Mackey being regarded as having the most thorough knowledge of milling and milling of any witness yet on the stand, we will give his testimony in full in our next week's issue.

The deposition of C. J. Weider, Wells-Fargo's agent at Gold Hill was next offered but not read, for the reason that from it Mr. Biggett wished to prepare a list showing bullion shipments from Jones to Hofer at Carson; also the bullion shipped by Jones to the Bullion and Exchange Bank, and also the bullion shipped by the Nevada and Mexican mills to the bank.

The deposition of E. F. Pierce of Carson showed a long list of bullion shipped to the Anglo-Californian Bank of this city, by which it was sold and the proceeds returned to the Bullion and Exchange Bank for the benefit of unknown owners.

The court adjourned over to Monday, December 7th.

Monday was a lively day in Judge Hebbard's court. A large amount of testimony was adduced showing the recklessness with which proxies were voted at the annual elections for directors of the company. A large number of mining men listened with eagerness to the proceedings during the day. The following stockholders testified to giving proxies for stock which stood in their names, but which was bought for or owned by customers: A. Dond, J. N. Saydam, S. Reddick, A. W. Foster, A. F. Coffin, J. Gillon and A. W. Starn. James Ralph, clerk of the Bank of California, was called to the stand. He testified that, at the time of the last election of Hale and Norcross, 4270 shares of the stock stood in his name as trustee. He had no interest in the stock. He gave his proxy, at the direction of the cashier of the bank, to some one whom he did not recollect. The owners of the stock he did not know. It was held by the Bank of California as collateral security for loans. Nathan Stein, note teller of Wells, Fargo & Co., testified regarding giving proxies for about 8000 shares.

A strong and determined fight was made over the admission as evidence of the books of the Nevada Mill & Mining Co., which was decided by Judge Hebbard in favor of the plaintiff, with the inquiry to be limited strictly to an examination of those entries relating exclusively to transactions with the Nevada mill, upon whose account the plaintiff charges that Hobart ordered Williams at various times as superintendent of the mill to pay checks to Levy, or on his account, during the period covered by the suit of between \$15,000 and \$20,000, and for the six months alone of 1890 of \$7800. The court also directed that any transaction between the Nevada mill and any of the officers of the Hale and Norcross were legitimate subjects of investigation.

"The charges here," said Judge Hebbard, "are conspiracy, and the examination of the books, in so far as they relate to collusive acts between the owners and officers of the mill and the officers of the mine, is proper to be shown at this time. The authorities, I am convinced, allow this to be done, not I will confine the examination to the proofs of collusive acts charged between the dates named in the complaint.

The defense promptly excepted to the ruling of the court, and Charles T. Bridge, book-keeper for Mr. Hobart, carried the books to the witness-stand.

Then Mr. Biggett offered the five checks mentioned last week drawn by the direction of W. S. Hobart and aggregating \$7800 in favor of H. M. Levy, not to the order of Superintendent Evan Williams, during the first half of 1890, indorsed by the Bullion & Exchange bank to the Anglo-Californian and other banks of this city. One of them, for \$1977, bore also the indorsement of H. M. Levy. All these checks were drawn by "W. S. Hobart, per Charles T. Bridge," and under general direction of the witness for Mr. Hobart to do so.

No effort was made to ascertain why the checks were drawn.

Tuesday was a day of argument over Mr. Biggett's proposition to compel the defendants to produce in court as a witness the superintendent of the mine, R. P. Keating.

Judge Hebbard ruled that the demand of the plaintiff to have Mr. Keating produced, or the alternative that the allegations contained in the affidavit of M. W. Fox be considered as in evidence, could not be granted. The court further held that the attempt to have the deposition of Mr. Keating taken by interrogatories in Nevada should have been shown by the plaintiff.

The deposition of Walter E. Sells, a director in Hale and Norcross from March, 1887, to March, 1888, was read. He did not know who asked him to become a director and did not know how many shares, if any, above the five necessary to make him eligible as a director he owned at the time of the election.

William Pierce, foreman of the Hale and Norcross since 1883, testifies that the ore was weighed on an average 1880 pounds.

M. W. Fox, the plaintiff, was called to the stand and testified that he was a stockholder in the Hale and Norcross Company, and has been continuously since Jan., 1886. He was the owner of 230 shares of stock. He first became a stockholder in the company in 1874, and the extent of his holdings from that time to 1890 depended upon the reports from the mine. He purchased stock both for investment and speculative purposes. Between 1889 and 1891 he owned from 500 to 1000 shares of the stock.

H. W. Tangerman, for 30 years miller and miner at Virginia City, after stating that he was familiar with the Nevada mill and the slimes pond, was asked if he had taken samples from the slimes pond. He replied that he had, and that on Nov. 24th last the material was assayed by D. Mindelef of 318 Pine St.

Evading Mining Laws.

The developments in the suit of M. W. Fox against the directors of the Hale and Norcross Mining Co. show the correctness of the position of the MINING AND SCIENTIFIC PRESS in its long-continued contention for a strict observance by all mining companies incorporated in this State of that part of Section 587, Civil Code, Section 1, Books of Mining Corporations, which reads as follows:

"* * * It shall also be the duty of the superintendent to file with the secretary a weekly statement, under oath, showing the number of men employed under him and for what purpose, and the rate of wages paid to each. He shall attach to such account a full report, under oath, of the work done in said mines, the amount of ore extracted, from what part of the mine taken, the amount sent to the mill for reduction, its assay value, the amount of bullion received, the amount of bullion shipped to the office of the company or elsewhere, and the amount, if any, retained by the superintendent. It shall also be his duty to forward to the office of the company a full report, under oath, of all discoveries of ore or mineral-bearing quartz made in said mine, whether by boring, drifting, alanking or otherwise, together with the assay value thereof. All accounts, reports and correspondence from the superintendent shall be kept in some conspicuous place in the office of said company, and be open to the inspection of all stockholders.

The only company on the Comstock that complies with the above law is the Overman, which gives both the ore sample and battery assays. If the Con. Virginia superintendent would give the ore sample assays of all ore sent to the mill for reduction, as well as the battery assays of that milled there, that company would also be conforming to the law. Other companies ignore or evade the spirit and letter of the law. Such things react to some extent in due time, and continued evasion of the requirements has caused a loss of faith in the Comstock mines, to the detriment of operations on that great lode.

MECHANICS' FAIR.—It has been thought that the Mechanics' Institute would omit its usual fair next year, owing to the overshadowing importance of the Chicago Exposition. However, at a meeting of the members of the Institute, after considerable debate, it was resolved to hold another fair at the Mechanics' Pavilion next year. During the discussion, the chairman said that, although the library was self-supporting, the Institute had to meet the following monthly expenses in addition to the insurance: \$110 for taxes, \$500 for interest, \$200 for repairs to buildings, and \$300 for street assessments. This statement completely overruled the objections of those who were opposed to holding a fair next year.

German Progress in Metallurgy.

In recent numbers of the PRESS, we have quoted from Dr. Wedding's paper before the American Institute of Mining Engineers on the "Progress of German Practice in the Metallurgy of Iron and Steel." Among other things, gas-fired boilers are used at some of their works. Fig. 1 of the accompanying cuts shows this arrangement. The economic gain at Hayingen is as follows: Before the use of regenerator firing, on 15 boilers, of 100 square meters heating surface, there was produced per square meter, per hour, 16 kilos of steam; afterward 20 kilos. At Friedenshutte, the gain is still greater—14 kilos of water per square meter, per hour, being evaporated, as against

Condition of Mining in California.

The Miners' Reasons for Calling a State Convention.

To the People of the State of California: The miners and citizens of Placer county, in calling upon the friends of the mining industry to meet in a State Miners' Convention to discuss their common grievances, and to devise ways for general relief, deem it proper to give to the people of this State, through the medium of this address, some of the many reasons which justify and call for this movement.

In doing this, we represent the industry of this State that within the last 43 years has poured into the channels of trade more than \$1,250,000,000 in gold and more than \$30,000,000 in silver. We represent the industry which can again furnish an equal amount if accorded the same fair and unrestricted freedom and en-

partment decisions and rulings, expose and break up a giant conspiracy, which for 12 years past, silently but surely has been, and is now engaged in alienating to itself the people's heritage in the mineral lands, and the annual gold product will double and treble its present figure.

Our grievance is only one—the unfair, unjust and oppressive construction and misconstruction of laws. But it bears on us from many directions and in many ways. From it many consequences have come, direct and indirect. Unless relief be had, and shortly, a large part of it will be entirely wiped out.

Commencing with 1837, the annual gold product of the State gradually diminished by reason of the working out of the rich shallow placers, which were the concentrations of ages of erosion of portions of the older auriferous placers and still older quartz veins. For the exploitation of the shallow placers, unskilled

less, the opportunities of many of our people for obtaining a living taken away, the best iron market in the State destroyed, and a hundred millions of gold that might to-day be in circulation, giving life to all other industries, still buried in nature's treasury. We have no wish to review all that has been stated pro and con relating to this during the last 12 years, but simply claim now, as then, that the magnitude of the industry, both absolutely and relatively, entitles it to the protection of law and not its oppression; that, as a consequence, conceding the fact that hydraulic mining debris has overflowed and injured farming lands, the first trial of relief is not to stop the mining, but to protect the farms. When this has once been fairly tried, if it fail, then is the time to consider other relief. But it will not fail. On this the testimony of disinterested experts is supported by the unanswerable logic of accomplished facts. Debris dams have been built in France and Italy; many of them have accomplished the purpose for which designed, and have stood the time test for 75 years. Disinterested experts have studied the problem presented by our mining debris, and say that it can be impounded and permanently restrained from injuring the farming lands. That statements herein may not rest on our assertion of them, we present for your consideration extracts from the report of the Commission of United States Army Engineers appointed by Act of Congress under what is known as the Biggs bill. This was initiated from a joint resolution of the California Legislature of 1887, being there unanimously agreed to. This Commission spent the years 1889 and 1890 in preparing its report, which was transmitted and received by Congress February 21, 1891. (Singularly enough, no friend of the mining industry has been able to see a copy of that report, until now, though its enemies long since had it.) We quote from the report.

Page 5 (referring to hydraulic mining), says: It is estimated that over one hundred millions of dollars were invested in this branch of mining previous to the restriction by the courts.

Pages 8 and 9: In 1880 it was estimated that the land in the Sacramento Valley damaged by mining debris from the Feather river, Yuba river and Bear river amounted to 41,045 acres, and the value of said land was \$2,510,835.

No mention is made of damage on the American river lands.

Page 14 and 15:

AMOUNT OF AURIFEROUS GRAVEL WORKABLE.

	Cubic yards.
North Yuba watershed.....	30,000,000
Middle Yuba watershed.....	140,000,000
South Yuba watershed.....	500,000,000
Deer Creek watershed.....	25,000,000
Below the forks of the Yuba.....	40,000,000
Bear river region.....	157,000,000
American above the forks.....	105,000,000
Total amount gravel available.....	1,117,000,000

Hydraulic miners thoroughly acquainted with the gold yield of these gravels, estimate the average gold content to be 30 cents a cubic yard, making an estimated total for these, of the almost inconceivable sum of \$335,000,000.

These figures include but a small portion of the watershed of the Sierra, while the same conditions are true to a greater or less extent throughout the entire gold fields of California extending from Siskiyou to San Diego.

In this report, in connection with estimates of workable auriferous gravels and in reference to proposed storage sites, figures of holding capacity to these sites are given, which show a clear margin over and above the estimates of workable gravels.

These sites for storage dams with estimates of cost are given as follows:

Page 13. Referring to the Yuba river.

One at DeQuette point to cost.....	\$640,000
Page 27—Restriction works on the Lower Yuba....	300,000
Page 73—Dam on Bear river.....	177,369
Page 78—Dam on North Fork of American.....	85,656
Page 81—Dam on Middle Fork of the American....	72,188
Page 82—Dam at Rattlesnake Bar, American river	195,891

Total cost of storage dams.....\$1,451,494

We have invited your attention at some length to hydraulic mining, not that it is the only branch of mining which is feeling the unfair interpretation of our laws, but because it has been crushed by it, and the story it tells is most emphatic. The same interpretation of law which has shut down the hydraulic mines can be used to shut down the drift and even the quartz mines. The language used in the decrees of injunctions of the State and Circuit Courts are so worded as to make possible their application to any other mining using water. Concerning this, the report of the Commission says:

Page 4: It will be observed that the decrees are not against hydraulic mining in name, but against the dumping of debris into the streams, ravines, etc., and it would therefore include all classes of mines, should any action be considered necessary to prevent the detritus from said mines entering the streams.

Page 4: All gold mining in California is hydraulic, being the same in principle—running water separating gold from the matter in which it is imbedded.

In addition to the possible and by no means improbable use of debris litigation, drift and quartz mining are hampered and restricted by forces, the pressure of which is only now beginning to be seriously felt. When in the early days of mining the miners made their local laws, they worked satisfactorily because adjusted to the special local conditions. Congress, recognizing this, made its general laws very simple, authorizing the making of the local laws, only adding a limitation as to the size of individual mining claims, and requiring a certain annual expenditure as a guarantee of good faith in holding the claim; also laws were provided for the patenting of

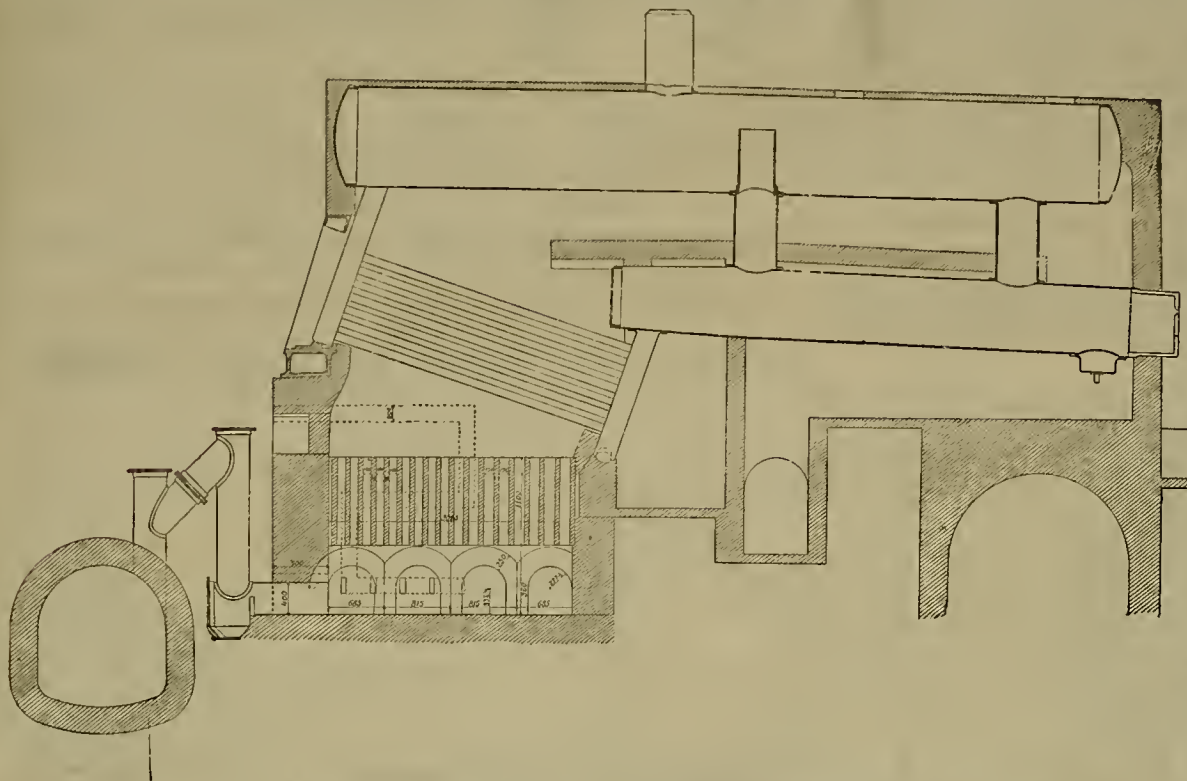


FIG. 1.—LONGITUDINAL SECTION OF GAS-FIRED BOILER AT FRIEDENSHUTTE, UPPER SILESIA.

8 to 85 kilos before the regenerators were used.

The production of ingot iron in the converter has experienced in Germany twice since 1876 a revolutionary change. In that year it was the admirable example of American works, far surpassing in their results, which led to a transformation of German establishments. It would be superfluous to enumerate all the arrangements adopted from the United States; the continuous premelting in the cupola; the continuous operation of the converter, and, above all, the Holley movable converter-bottom may be mentioned as the three most important. With regard to the movable bottom, Holley's original construction was abandoned, little by little, in favor of the draw-bottom, of which Fig. 2 shows the usual form, and which has the great advantage, that without breaking the blast connections, the wind-box only being removed, the bottom can be drawn out and replaced with a fresh one. With regard to the air-passages, some have used bottoms with grouped tuyere holes, and others the tuyere-bottom of Lillenstein, but neither has shown, in the acid Bessemer process, any marked superiority to the other.

In one of the articles quoted, we illustrated the ladles used to transfer the molten metal. In some cases, it is necessary to pass the ladle from one crane to another. Again, the same crane serves to bring the ladle containing liquid pig from the blast furnace and to receive the ladle containing ingot iron from the converter. The latter ladle is delivered to a second crane, which stands in the center of the casting-pit. Fig. 3 shows the arrangement here employed to prevent disaster occurring through a sudden failure of hydraulic pressure in the cylinder. It will be seen that if the crane *a* should suddenly sink while in the position indicated by the dotted lines, the ladle could not strike the mold *c* because of the leg *d* attached to the lower side of the crane-arm, which would be stopped in its descent immediately by the masonry ring *e*. To lower the converter farther, the foot *d* must be brought round to the recess *i*. This is the position shown by full lines in the figure.

It may be remarked here that there are many other devices for the protection of the workmen in this department, particularly at Neunkirchen, where there is a gutter beneath the floor, which serves in case of a breakdown to direct the flow of molten metal to a pot.

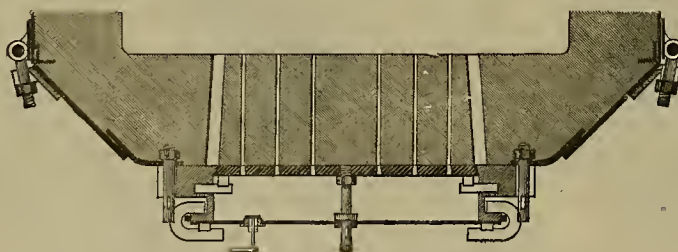


FIG. 2.—DRAW-BOTTOM FOR CONVERTER.

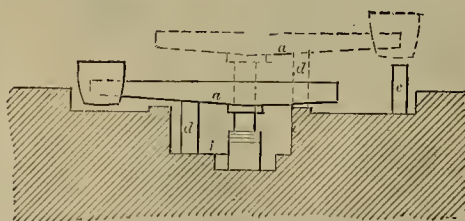


FIG. 3.—SAFETY STOP ON STEEL-CASTING CRANE.

couragement which is so wisely extended to all other industrial pursuits; and we represent the industry that, if it did not create the State, at least created all the conditions that entitled it to become one of our glorious Union, and then furnished the means that enabled that Union to maintain its integrity against the most gigantic struggle for disintegration ever known to the world.

California, with its grand gold product, still leads the combined aggregate gold product of all the other States and Territories by a thousand millions, and leads the aggregated gold, silver and copper product of any one of them by over six hundred millions. Even now, the annual gold product of California, restricted as it is, by unjust abnormal causes, is far in the lead of that of any other State, is a third of the total of all of them, and a ninth of the total gold product of the world. We claim, and propose to show to you, that once release the industry from the dragging friction with a small portion of the agricultural industry, clear away the tangling legal web of unfair Court and De-

labor answered, but for the uneroded portions of the older placers and the auriferous quartz veins, labor alone was powerless, requiring the assistance of capital. Then, too, for these last, the conditions of their existence had to be studied and learned, and new methods and appliances of mining, tested and developed. Necessarily, the gold yield to replace the rapidly diminishing product of the shallow placers came slowly. The most readily accessible of these new sources of gold, the quickstart of development and the swiftest of returns, was found to be in the vast deposits of exposed auriferous gravels, the detritus of an extinct river system. In their exploitation, the great industry of hydraulic mining was developed. By itself, in the latter seventies, it was fast increasing the annual gold product of the State, when the legal fight against its existence was commenced, that has continued uninterruptedly since, and resulted in its practical oppression. As results of this litigation, have come the depopulation of whole communities, the property accumulations of years have been made value-

mineral claims in compliance with defunct conditions. So satisfactory were the general laws that they soon superseded the old local laws in this State. During the last ten years, however, Court and Department decisions and rulings have been placing new and restricted interpretations on the statutes, making more difficult the acquiring of patent, and have finally gone further and practically nullified the act of Congress reserving the mineral lands from other than mineral entry and patent. The plain, obvious conditions of existence of our mineral deposits have been ignored and in their place rules set up which will tend to prevent the exploration for mines in these lands and seal up their treasure indefinitely. The statutory requirements to obtain patent are: 1st. A valid location of mineral ground. 2d. Proof of bona fide expenditure of \$500 for labor and improvement; and 3d. No valid adverse claim.

By virtue of decisions and rulings, the requirement now is that the mineral claim shall be a paying mine. Now it is plainly evident that the expenditure of \$500 will not make a mine pay or even develop that it will pay once in a thousand times. Inasmuch as capital will not risk the large amounts necessary without certainty of title in advance, it follows that very few new mines will be sought for.

The shutting down of the hydraulic mines destroys the value of their vast bodies of auriferous gravels. The restrictive interpretations of the mining laws are discouraging the prospecting for new drift and quartz mines and stopping the development of many already discovered. The practical effect of it all is, that the mineral lands are left open to entry and appropriation in large tracts as agricultural, timber or desert lands till mineral shall be actually mined in paying quantities. This was not the intent of Congress, which aimed to encourage the exploration and development of the mineral lands as such.

We have called on the friends of the mining industry to meet in convention to discuss these obvious wrongs against us. We desire, through this convention, to obtain unity of action in securing remedies. We desire to have it so memorialize Congress as to secure prompt and favorable action on the report of the Commission of Engineers herein referred to. We desire, as a matter of simple justice in part return for the losses of ten years' repression of hydraulic mining, as a part of the general public policy of the nation toward its industries, and as a guarantee, both to farmers and miners alike, of a fair, unrestricted trial of the debris dam, that they shall be constructed by the Government and that Congress shall appropriate the money therefor. We desire, further, to so memorialize Congress as to secure such changes in the mining statutes as shall more exactly define the rights of mining exploration, occupation and purchase, and prevent their acquisition in any other way than under the mining laws of the United States.

In addressing the people of the State, we say that our grievances are in a measure yours; we say that the relation of gold mining to the other industries is such that all the others have a vital interest in its prosperity and extension. Gold is the life-blood of society. It is the measure of all wealth and the medium of all exchanges.

Its abundance is of vital, never ending importance, and that State which has the most per capita is the strongest and most prosperous, for it commands the labor, the products and the wealth of the others. Again, where all other industries compete within themselves and against each other in the struggle to become wealthy and lessen individual rewards as they grow, the gold and silver mining industries stand by themselves as those which in their extension increase individual rewards, not alone of their followers, but of the followers of all other industries. They are the only industries that are not competing producers, but on the contrary are competing consumers for all the others.

Apply these general economic truths to our own local California. Consider the disturbance in our affairs caused by a flow of fifty millions of dollars of gold from New York to Europe last spring. Of that fifty millions, five millions was withdrawn from the monetary circulation of our State, disturbing and unsettling values and making money hard to get. Consider if we had ten millions more coming out of the earth every year to meet just such drains, would not we be more assured in our prosperity as a State, and would not each industry feel the additional impulse that this amount of gold would give?

These then are the conditions and some of the reasons why we call on the friends of the material industry of the State to meet us in this convention, and we commend them to your consideration, confident that in them you will see our interest as yours.

By the committee on address.

R. L. DUNN,
J. H. NEFF,
M. SCHNABEL,
J. M. FULWILLER,
GEORGE COLBY,
JOHN B. HOBSON,
CHARLES G. YALE,
J. A. FILCHER,
AMOS STEVENS,
NOBLE MARTIN,
D. W. SPEAR.

FOR SALE—A GOLD MINE (QUARTZ), WELL DEVELOPED; for particulars, address G. W. MUNROE, Glenora, Calaveras County, Cal.

Assessment Notices.

GRANOVILLE VINEYARD COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Hanford, Tulare County.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of November, 1891, an assessment, No. 4, of \$1.00 per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California. Any stock upon which this assessment shall be made unpaid on the 15th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. MERSEFELDER, Secretary.

Office, 111 Front Street, San Francisco, California.

CALIFORNIA CREAMERY COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Novato, Marin County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 2d day of November, 1891, an assessment, No. 1, of Fifty Dollars (\$50) per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, 111 Front Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of December, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of January, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. MERSEFELDER, Secretary.

Office, 111 Front Street, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There is delinquent upon the following described stock, on account of Assessment (No. 26) levied on the 27th day of October, 1891, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Jane A. Armstrong, Trustee.....	522	105	\$ 4 20
J M Buffington, Trustee.....	522	1,040	41 60
W H Buffington, Trustee.....	512	1,100	44 00
O H Bogart, Trustee.....	447	5,000	200 00
O H Bogart, Trustee.....	448	1,000	40 00
O H Bogart, Trustee.....	449	1,000	40 00
O H Bogart, Trustee.....	450	1,000	40 00
O H Bogart, Trustee.....	451	1,000	40 00
O H Bogart, Trustee.....	453	500	20 00
O H Bogart, Trustee.....	473	214	8 58
S E Brown, Trustee.....	287	100	4 00
S E Brown, Trustee.....	312	500	20 00
S E Brown, Trustee.....	530	515	20 60
A W Barrows, Trustee.....	547	1,000	40 00
A W Barrows, Trustee.....	550	100	4 00
A W Barrows, Trustee.....	555	271	10 84
A W Barrows, Trustee.....	556	500	20 00
A W Barrows, Trustee.....	559	1,000	40 00
A W Barrows, Trustee.....	563	500	20 00
A W Barrows, Trustee.....	564	500	20 00
A W Barrows, Trustee.....	568	1,000	40 00
A W Barrows, Trustee.....	573	100	4 00
A W Barrows, Trustee.....	576	500	20 00
A W Barrows, Trustee.....	579	200	8 00
A W Barrows, Trustee.....	598	500	20 00
A W Barrows, Trustee.....	599	500	20 00
A W Barrows, Trustee.....	630	300	12 00
A W Barrows, Trustee.....	601	200	8 00
A W Barrows, Trustee.....	603	500	20 00
A W Barrows, Trustee.....	610	500	20 00
A W Barrows, Trustee.....	611	500	20 00
A W Barrows, Trustee.....	625	50	2 00
A W Barrows, Trustee.....	627	25	1 00
A W Barrows, Trustee.....	632	500	20 00
W A Carnes.....	252	410	16 64
H L Francis, Trustee.....	591	1,100	44 00
W E Lane, Trustee.....	593	200	8 00
H W Nash, Trustee.....	269	104	4 16
H M Rosekrance.....	39	600	24 00
W A Searles, Trustee.....	297	645	25 80
W A Searles, Trustee.....	316	1,000	40 00
W A Searles, Trustee.....	321	250	10 00
W A Searles, Trustee.....	464	215	8 60
W A Searles, Trustee.....	518	1,000	40 00
W A Searles, Trustee.....	519	608	24 24
W A Searles, Trustee.....	542	100	4 00
C S Stout, Trustee.....	478	2,000	80 00
C S Stout, Trustee.....	477	253	10 12
Mrs M E Stout.....	170	500	20 00
Mrs M E Stout.....	183	500	20 00
J N Taylor, Trustee.....	532	1,040	41 60

And in accordance with law, and an order of the Board of Directors, made on the 27th day of October, 1891, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 21st day of December, 1891, at the hour of one (1) o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

A. W. BARROWS, Secretary.

Office, Room 11, No. 303 California street, San Francisco, California.

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Assaying.

A second edition of Parts II and III of "Assaying," by C. H. Aaron, has just been issued by Dewey & Co., 220 Market St., S. F. In this edition all superfluous matter, such as a preface, is omitted. A portion of the text of the first edition, which properly belonged to Part I, appears in the 2d edition of that part, or the first volume. This edition contains the same number of pages as the first, namely, 161; but, in consequence of the above mentioned changes, a great part of the matter is new, comprising a description of Volhart's humid assay of silver bullion, additional methods for the assay of sulphur, arsenic, antimony, chromium, etc., a new and accurate gravimetric method for copper never before published in any book, and a new and rapid method for zinc, in which the troublesome zinc sulphide is avoided and only stable reagents are used, and which also has never before appeared in a book.

The chapter on "Manipulation" is extended, and to the note at the end of the volume are added some valuable suggestions as to volumetric assaying in general, and the method by iodine and sodium thiosulphate in particular. In fact, it seems a pity that the last named system has not been described in detail, though the author appears to have refrained from doing so, because it would have carried him beyond his proposed limit, or perhaps in accordance with his usual practice of teaching only that with which he is practically familiar.

The book is not arranged in a manner to adapt it for use as a text-book, and the author disclaims any such intention. As a working hand-book, in conjunction with Part I, treating of the assaying of gold and silver ores, and especially for the use of that large class of assayers who have but little knowledge of chemistry, and have not command of an extensive laboratory, it has no superior, perhaps no equal in the market.

As stated, Part I of these books treats of gold and silver ores in a separate volume. Parts II and III are printed in one volume, of which the work under review is a new edition. Part II is on gold and silver bullion. Part III treats of lead, copper, tin, mercury, zinc, nickel and cobalt, chromium, bismuth, arsenic, antimony, sulphur and salt. This volume (Parts II and III) is sold for \$1.75, post paid.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DEC. 1, 1891.

- 464,261.—INSTRUMENT FOR TAKING NAUTICAL OBSERVATIONS—W. H. Bebler, U. S. Navy.
464,272.—ASH PAN AND BOILER CLEANER—Brennan & Pitcher, Needles, Cal.
464,011.—CULTIVATOR—Jos. Craig, Woodland, Cal.
464,150.—DEVICE FOR PACKING FRUITS—J. M. Davies, Florin, Cal.
464,276.—FAUCET—A. W. Delane, San Diego, Cal.
464,357.—BICYCLE—M. B. Gibson, Ukiah, Cal.
464,340.—ROCK DRILL—H. S. Grace, S. F.
464,128.—FRUIT PITTER—Jacob Harps, San Fernando, Cal.
464,360.—SUPER FOR BEE HIVES—W. A. Hawthorne, Carson, Nev.
464,155.—FURNACE FOR STEAM BOILERS—A. Heberer Alameda, Cal.
464,342.—PROPULSION OF TRAINS—J. B. Mahana, Freewater, Oregon.
464,380.—FRUIT GATHERER—D. G. McClay, Santa Ana, Cal.
464,284.—CHANDELIER DISPLAY HANGER—M. Meyberg, Los Angeles, Cal.
464,107.—DUST GUARD FOR CAR AXLE BOXES—J. Pettibonnie, Oakland, Cal.
464,485.—PRINTING PRESS—H. Swain, S. F.

The following brief list by telegraph, for Dec. 8, will appear more complete on receipt of mail advices: California—Lorenzo D. Clark, Fort Jones, automatic trickler for hand presses; Luth. Cunningham, Saratoga, prune sacking and rinsing machine; A. J. Edmondson, San Buenaventura, railway rail joint; Isaac Kuhn, San Diego, overalls; J. E. M. Prentice, San Francisco, typewriting machine; Moses H. Robinson, San Diego, apparatus for discharging water; Louis Stuber, San Francisco, automatic vent for casks; Maldeimar Terp, San Francisco, apparatus for heating and ventilating rooms; Wm. H. Towns, San Jose, dressing for carriage to ey. Frank Walker, Los Angeles, disintegrating furnace; G. H. Melendy, San Francisco, plane attachment.
Nors.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

MISS ALICE RIDGOUT of San Francisco has been awarded the first prize in the contest of women sculptors for the designs for statuary to ornament the woman's building at the World's Fair.

G. NATHAN, a recent faithful employe of this office, whom we trust and hope will do well, has established a candy store and manufactory at No. 1245 Broadway, near 15th St., Oakland.

Academy of Sciences.

On Monday evening President D. S. Jordan, of the Leland Stanford Jr. University, delivered a lecture on "The Trout of California." Among those in the audience were many anglers who were anxious to hear Prof. Jordan speak on the subject announced. He showed very conclusively that there was no such thing as a "salmon-trout"—a much mooted question—pointing out how the fish of each species could be distinguished. By counting the spikes in the anal fin it will be seen that there is a marked difference in the number of those in a salmon or a trout. The species of trout may be distinguished by counting the scales on the lateral line. In fact, the detection of species is more of a mathematical calculation than anything else. We shall endeavor, on another occasion, to give this lecture in full, when it has been revised by its author.

The museum of the Academy is now open to the public for the first time in the new building.

The main hall of the museum has been put in excellent order. No new specimens have been added to the collection, but the old ones have been carefully rearranged. On each side of the large door leading into the hall is a suit of Japanese armor. To the right of the door are ten clay models of the cliff-dwellers' houses from ruins in New Mexico and Arizona. Next comes a long wall case containing over 50 skeletons of various animals. A human skeleton stands in a case by itself in the right-hand front corner of the immense room.

Arranged clear around the hall are 32 new oaken table cases, containing minerals and ornate cases. Scattered here and there are plaster models of various portions of extinct animals. Against each pillar is a bust of some great scientist, such as Buffon and Cuvier.

In the center of the hall stands the great model of the mammoth, copied from that found in Siberia and now in the museum in St. Petersburg. This gigantic beast is upon a raised platform, about which are clustered a great variety of objects of interest. On the left-hand corner, near the entrance door, is a stuffed orang-utang. Back of this is a singular sponge-like formation known as "Neptune's cup." Next come the immense head and trunk of the Elephas Genesee. Still farther along, that is, toward the end of the large platform upon which stands the mammoth, is the skeleton of the Elephas India, a fossil elephant. Back of the mammoth is an enormous mammoth's trunk from Alaska beside a tremendous tortoise shell. There are other large specimens and many hundred small ones. The collection is growing and is, already, by far the best on this coast.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, \$3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

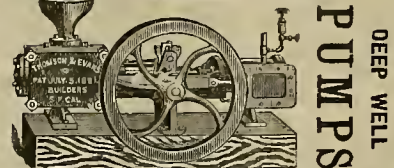
MINERAL LANDS AND PATENTS.—The Commissioner of the General Land Office has decided the case of Richard Barden and others against the Northern Pacific railroad. The land in controversy was returned as agricultural, but subsequent to the filing of the railway's definite location, it was discovered to be mineral. The Commissioner holds that the discovery of the mineral character of the land before patent issues, excepts the land from the grant. A similar case is now pending in the United States Supreme Court of Appeals from the Circuit Court of Montana.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, or beyond the time he intends to pay for it, let him not fail to write us direct to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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The work, like Mr. Aaron's former publications ("Testlog and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular" is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assay; Examples of Dressing; The Melting in Crucibles; Scorchification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Course Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

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One of the methods given for the Assay of Copper is new, original and exact, as is also one of the processes for Zinc. The book contains 161 pages with illustrations, and is strongly bound in cloth. Much of the original text is replaced by new matter.

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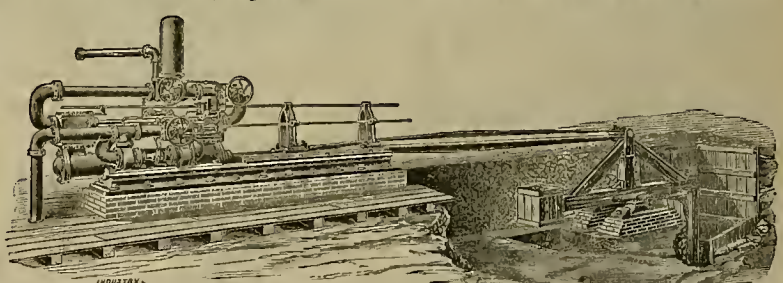
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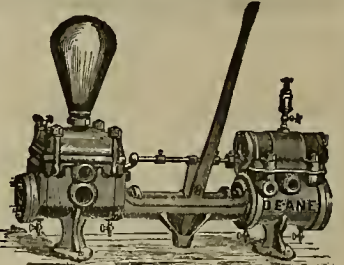
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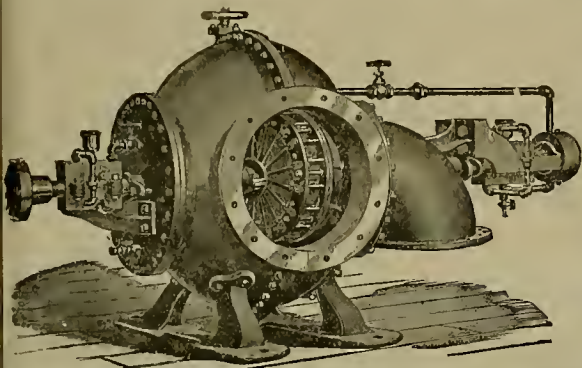
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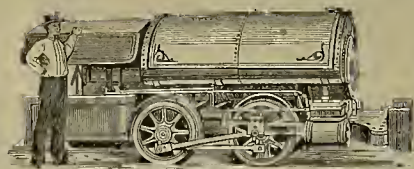
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 10, 1891.

Rains in the valleys and snow deposits on the mountain ranges, cause a more cheerful feeling in business circles by inspiring the belief that with this year's crop so well marketed, and with the weather outlook favorable for farming and mining, that 1892 promises to be quite prosperous, notwithstanding its being the presidential election year. Iron-workers continue to report active business. The larger companies have bought raw material quite heavily in anticipation of higher prices later on. The local money market is fairly active but easy. Banks report more funds in hand than usually obtained in this month.

The election of Crisp, of Georgia, Speaker of the House of Representatives, is accepted as favorable to the silver interest.

The Eastern money market is reported as follows by the *Iron Age*: "Money continues extremely easy. Even in Boston there is a plethora of funds. Foreign trade is in good condition. In spite of the heavy specie exports in October, the United States exported in merchandise and produce during that month an excess of over \$35,000,000, compared with the imports, the aggregate exports on account of commodities being \$102,900,000. For ten months there is a balance of trade amounting to \$901,000,000, against \$15,000,000 for the same period last year. Further imports of gold bring up the total since Sept. 12th, when the return movement commenced, to nearly \$25,500,000, with \$1,500,000 on the way."

MEXICAN DOLLARS—The market hangs around 75 cts. The demand is only fair.

QUICKSILVER—The market continues firm at combination prices. Receipts the past week aggregate 367 flasks.

SILVER—The market has held to stronger prices throughout the past week, due to depleted supplies abroad and in this country, and to a more favorable attitude of monometallic foreign countries toward bimetalism. The defeat of Mills for speakership of the House of Representatives, it is claimed, was largely due to his speeches on silver in the Ohio campaign. It is the very general belief that a free-coinage bill will be passed by Congress which will be vetoed by the President. If this proves to be the case, then silver will come forward in the Presidential election as an important issue. Bimetallists, without reference to party, will unquestionably vote for the candidate favorable to their views. New York telegrams received to-day report silver at 95 cts.

BORAX—The market is steady at combination prices. The shipments by sea the past week aggregate to New York \$11,427 pounds via Panama and 201,506 pounds via Cape Horn.

LIME—Receipts the past week aggregate 7886 bbls. The market is steady, with a continued good demand reported.

ANTIMONY—The market is firm but quiet.

LEAD—The market is quiet but fairly steady. Eastern advices report a dead and inactive market, with both holders and buyers showing considerable indifference.

IRON—The market for spot, to arrive and for shipment is strong, with an advance asked. The offerings from first hands for spot and to arrive are light. English advices report a dull but fairly firm market. Eastern advices report a stronger undertone due to prospective large requirements in 1892 by the railroads of the country. At Philadelphia, the market is reported as follows: There is more inquiry, perhaps, and more disposition to do business at inside figures, but for the present it is out of the question to think of an advance. The immense output imparts a sense of security to consumers that is hard to disturb, and so long as indications of a full supply continue, it will be difficult to make buyers believe that prices are likely to be higher. That, however, no one expects, the near approach of the holidays, with the consequent temporary suspension of work, being an insurmountable barrier to any immediate movement of that kind.

COPPER—Exports the past week aggregate 665,142 lbs. matte to New York via Cape Horn. The market is about as heretofore reported. The New York market is reported as follows: "Consumers are taking supplies only as imperative wants necessitate, and while outward appearances suggest that the leading producers are indifferent, the fact remains that there is an abundance of copper to sell and that buyers have a voice in fixing the price. Spot parcels of Lake Superior ingot are valued at 17 1/2 cts. Bids of 17 cts have been refused within a few days. It is understood that 17 cts has been offered for fair-sized quantities, deliverable during the first half of next year." London cables to the *Iron Age* of Dec. 3 are as follows: It is stated that copper formerly held by outsiders is now in the hands of dealers. Consumers are buying more freely, present prices being attractive. The properties of the Societe des Metaux reported sold to Credit Industriel at small advance on upset price.

TIN—The market is dull, with no special features to report. Eastern mail advices report a dull and heavy market for both pig and plate. London cables report pig dull and easy, and plate as follows: There is more inquiry from America, but not much business has resulted thus far. Owing to lowness of prices offered, many makers have decided to close their works for one month, from the middle of December, but there is no general movement in that direction. Several large makers are opposed to combined action to reduce the output, considering this course not warranted.

COAL—Imports the past week aggregate as follows: Comox, 4490 tons; Departure Bay, 5590; Newcastle, N. S. W., 2107; Coos Bay, 750; Nainaimo, 4290; Seattle, 2700; total, 19,801 tons. The market shows, apparently, a steadier tone. Cold weather is inducing larger consumption, which naturally causes dealers to stock up more freely. The tonnage on the way from Australia is about 30 per cent less than it was four weeks ago, while the high asking rates for charters at Newcastle, N. S. W., precludes shipments of coal except at an advance.

GEORGE CULLEN PEARSON, manager of the Damata mines, the first in this State to establish a complete electric power plant, left for England this week, to be gone a few months.

Mining Share Market.

Under the proxy system, the rings have been able to keep their dummy directors in office from year in to year out.

Mining shares the past week were decidedly mixed, showing that a master general is in command of the manipulation. The North End shares shined off from 10 to 15 per cent, the Middle shares hung around with a firm tone for Chollar, Hale & Norcross and Savage. The Gold Hill shares went off from 10 to 20 per cent—Crown Point and Challenge suffering the most. Several of the shrewdest operators short the market as soon as they know D. O. Mills is coming to the coast, and remain short until just before or soon after he leaves to return to the East. They claim that Mr. Mills is "deadly" opposed to an advance in the market, for they say he thinks that more money is to be made by those on the inside in another and far more easy way. This report, which is quite general in certain stock circles, we give for what it is worth, yet it is a singular coincidence that the Gold Hill shares, the mines in which he is supposed to be largely interested, appear to suffer heavily on his visits to this coast.

In outside mining shares the Bodies show considerable life, at slight fluctuations. In the shares of Peer and Peerless in the Qujotua district trading was fair at steady prices. The mill is to start up next week on the ore now on the dumps. Several of the Tuscarora mines continue to ship high-grade ore for reduction.

The pools continue to use the suit against the Hale and Norcross directors and the owners of the Nevada Mill and Mining Co., for all it is worth to get outsiders to sell stocks. There is everything to warrant the assertion that seldom, if ever before, the trading public was in such a demoralized condition as at present. While the large majority has sold out, yet there are many who hold only to sell when the market turns so as to let them out even. If past experience is worth anything this is a good time to buy, for with the public selling, the pools must be concentrating, and sooner or later a deal will be made to unload at a good round profit.

Con. Virginia sold the past week at \$3.65 per share, which is nearly as low as insiders said four months ago that it had to go down to; and yet there are gudeguons who say that the pools do not work by any fixed rules, outside of virtually robbing those of the public who have the temerity to deal in stocks.

Several stockbrokers testified in the Hale and Norcross suit that they gave their proxies for stock which stood in their names, but not owned by them, to be voted at the last election of that company. Lawyers who have given the question close study think that in so doing they can be co-defendants in any suit for fraud, misappropriation of funds, etc., instituted against the directors of the company.

The mill rings are fearful that the San Francisco Stock and Bond Exchange may take action looking to preventing brokers from giving proxies for shares not their own, to be voted at a mining company's election. Thugs and their tools say that if proxies are not given them, it is likely that no change in directors or management can be looked for. Seeing that under the proxy system there have been no changes, it looks as if any change in the system would not be any worse, while it might be for the better. Let those who want to control the mines go into the market and buy up the stock, and in so doing more lively times will certainly follow. The proxy system has been the death-knell to the stock business by putting those in office who do not look after shareholders' interests, if we are to accept the developments in the Hale and Norcross suit as typical of what is done on the Comstock.

News from the Comstock mines is still kept back by the pools or rings. It is known that in several of the North End mines, several levels are being opened up for better developing work, and also for ore extracting. Important results can be looked for at an early day. In the Middle mines, the work continues to be very important. Various levels are being opened up for easy extraction of the rich ore found to the west. The officials are still reticent regarding the ore found on the Ward shaft level. In 1890, it was officially announced that the 850-foot Ward shaft level was connected with the Bullion-Potosi works, which would admit of important work. Since then no mention has been made of it. What has become of the west ledge found in both Exchequer and Alpha and which it is said has been run for on several levels. Official letters from Con. Imperial report that ore is being taken out and saved for milling, but the letters fail to report what was accomplished by the work on the 750 foot and 1100 foot levels. Private advices report that in last month four feet of rich ore was struck to the west in Challenge. It is singular that Yellow Jacket does not develop the 1100, 1200 and 1300 foot levels. Mysterious hints are being put out about important work and ore finds in two of the South End mines. The Overman Co. continues to conform to the law by giving both car-sample and battery assays. Why is it that the other companies do not do the same?

Brokers who are not purchasable should see that their Exchange is purged of the odium brought on it through the proxy system.

From the outside mines the news continues to grow in interest, as it always does when the rings have the stocks and are about prepared for a deal so as to unload.

Things on the Comstock are somewhat changed. The time was when the hounds hunted the Fox, but now it is the Fox that hunts the hounds.

The mining share market opened higher this (Thursday) morning, with still better prices at the 2:30 o'clock board. The points are out for slightly better prices to-morrow (Friday), when they should go off to figures lower than they sold at any time this week, after which we will have a good substantial up-move. No one believes that there will be any change in the Savage management, owing to the ring wishing the present officers to be kept in as a scare-crow to frighten outsiders from buying the stock.

PROF. JOHN SLATE has been elected to the Professorship of Physics in the University of California, the place made vacant by the death of Prof. John Le Conte. He has been in the service of the University for ten years, most of that time in charge of the department of

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

COMPANY AND LOCATION.		ASSESSMENTS.		SECRETARY.	
Alpha Ores M Co, Nevada.	7.25c.	Nov 4, Dec 3, D c 23.	Nov 4, Dec 3, D c 23.	C E Elliott, 309 Montgomery	Nov 4, Dec 3, D c 23.
Best & Belcher M Co, Nevada.	50.25c.	Nov 6, Dec 11, Dec 31.	Nov 6, Dec 11, Dec 31.	L Oshorn, 39 Montgomery	Nov 6, Dec 11, Dec 31.
Bulwer M Co, California.	7.15c.	Oct 28, Dec 4, Dec 31.	Oct 28, Dec 4, Dec 31.	L Oshorn, 39 Montgomery	Oct 28, Dec 4, Dec 31.
California Verde Marble Co, California.	1.1c.	Nov 4, Dec 7, Dec 28.	Nov 4, Dec 7, Dec 28.	W J Gurnett, 308 Pine	Nov 4, Dec 7, Dec 28.
Chollar M Co, Nevada.	4.1c.	Oct 25, Nov 30, Dec 22.	Oct 25, Nov 30, Dec 22.	O E Elliott, 309 Montgomery	Oct 25, Nov 30, Dec 22.
Confidence Silver M Co, Nevada.	19.75c.	Nov 17, Dec 23, Jan 11.	Nov 17, Dec 23, Jan 11.	A B Croft, 414 California	Nov 17, Dec 23, Jan 11.
Crown Point M Co, Nevada.	32.5c.	Nov 2, Dec 8, Dec 29.	Nov 2, Dec 8, Dec 29.	J L McCoy, 331 Pine	Nov 2, Dec 8, Dec 29.
Crown Point M Co, Nevada.	56.50c.	Dec 2, Jan 6, Jan 27.	Dec 2, Jan 6, Jan 27.	J L McCoy, 331 Pine	Dec 2, Jan 6, Jan 27.
Eureka Con M Co, California.	4.1c.	Oct 25, Nov 30, Dec 21.	Oct 25, Nov 30, Dec 21.	D M Kent, 330 Pine	Oct 25, Nov 30, Dec 21.
East Best & Belcher Silver M Co, Nevada.	7.20c.	Oct 15, Dec 15, Dec 31.	Oct 15, Dec 15, Dec 31.	H Mason, 303 Montgomery	Oct 15, Dec 15, Dec 31.
Full River Con Gold Quartz M Co, California.	5.20c.	Oct 20, Nov 20, Dec 21.	Oct 20, Nov 20, Dec 21.	L Casset, 115 Front	Oct 20, Nov 20, Dec 21.
Gray Eagle M Co, California.	25.40c.	Oct 27, Nov 30, Dec 21.	Oct 27, Nov 30, Dec 21.	A W Barrows, 303 California	Oct 27, Nov 30, Dec 21.
Hale & Norcross S M Co, Nevada.	99.45c.	Oct 16, Nov 24, Dec 15.	Oct 16, Nov 24, Dec 15.	A B Thompson, 39 Montgomery	Oct 16, Nov 24, Dec 15.
Head Centre and Tranquility M Co, Arizona.	3.50c.	Nov 12, Dec 18, Jan 11.	Nov 12, Dec 18, Jan 11.	J W Pew, 310 Pine	Nov 12, Dec 18, Jan 11.
Horse Shoe Bar Cons M Co, California.	2.15c.	Oct 30, Dec 1, Dec 23.	Oct 30, Dec 1, Dec 23.	D M Kent, 330 Pine	Oct 30, Dec 1, Dec 23.
Kentucky C M Co, Nevada.	15.10c.	Oct 26, Dec 1, Dec 23.	Oct 26, Dec 1, Dec 23.	J W Pew, 310 Pine	Oct 26, Dec 1, Dec 23.
Moigan M Co, California.	15.10c.	Nov 20, Dec 18, Jan 20.	Nov 20, Dec 18, Jan 20.	O B Reese, 239 Montgomery	Nov 20, Dec 18, Jan 20.
Occidental Con M Co, Nevada.	8.20c.	Nov 19, Nov 23, Dec 16.	Nov 19, Nov 23, Dec 16.	A K Durbow, 308 Montgomery	Nov 19, Nov 23, Dec 16.
Peer M Co, Arizona.	5.20c.	Nov 5, Dec 2, Dec 22.	Nov 5, Dec 2, Dec 22.	N T Mason, 303 Montgomery	Nov 5, Dec 2, Dec 22.
Peer & Savage Gold M Co, California.	1.10c.	Oct 18, Nov 23, Dec 11.	Oct 18, Nov 23, Dec 11.	F W Seltz, Forest City	Oct 18, Nov 23, Dec 11.
Savage M Co, Nevada.	77.50c.	Nov 5, Dec 8, Dec 28.	Nov 5, Dec 8, Dec 28.	E B Holmes, 308 Montgomery	Nov 5, Dec 8, Dec 28.
Seg Belcher & Mides Cons M Co, Nevada.	9.25c.	Oct 29, D c 1, Dec 21.	Oct 29, D c 1, Dec 21.	E B Holmes, 39 Montgomery	Oct 29, D c 1, Dec 21.
Silver Hill M Co, Nevada.	2.2c.	Oct 13, Nov 16, Dec 17.	Oct 13, Nov 16, Dec 17.	S W Cox, Chronicle Building	Oct 13, Nov 16, Dec 17.
Silver Hill M Co, Nevada.	10c.	Nov 12, Dec 15, Jan 5.	Nov 12, Dec 15, Jan 5.	D G Bakes, 39 Montgomery	Nov 12, Dec 15, Jan 5.
Targum M Co, Mexico.	6.10c.	Dec 1, Jan 4, Jan 22.	Dec 1, Jan 4, Jan 22.	A Chemant, 328 Montgomery	Dec 1, Jan 4, Jan 22.
Utah Con M Co, Nevada.	13.25c.	Oct 16, Nov 24, Dec 18.	Oct 16, Nov 24, Dec 18.	A H Fish, 309 Montgomery	Oct 16, Nov 24, Dec 18.

MEETINGS TO BE HELD.

COMPANY AND LOCATION.		MEETING.		SECRETARY.		DATE.	
Andes M Co, Nevada.	Annual.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	J W Pew, 310 Pine.	J W Pew, 310 Pine.	Dec 13.	Dec 13.
Gold & Curry S M Co, Nevada.	Annual.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	A K Durbow, 308 Montgomery.	A K Durbow, 308 Montgomery.	Dec 13.	Dec 13.
Ke tuck Con M Co, Nevada.	Annual.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	J W Pew, 310 Pine.	J W Pew, 310 Pine.	Dec 13.	Dec 13.
Mount Diablo M & Co.	Annual.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	E B Holmes, 39 Montgomery.	E B Holmes, 39 Montgomery.	Dec 13.	Dec 13.
Opbir S M Co, Nevada.	Annual.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	E B Holmes, 39 Montgomery.	E B Holmes, 39 Montgomery.	Dec 13.	Dec 13.

LATEST DIVIDENDS—WITHIN THREE MONTHS.

COMPANY AND LOCATION.		AMOUNT.		SECRETARY AND OFFICE IN S. F.		PAYABLE.	
Champion M Co.	10.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	T Wetzel, 320 Sacramento.	T Wetzel, 320 Sacramento.	Aug 13.	Aug 13.
Cons Cal & Virginia M Co, Nevada.	50.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	A W Haves, 303 Montgomery.	A W Haves, 303 Montgomery.	Aug 17.	Aug 17.
Crocker M Co.	25.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	J W Pew, 310 Pine.	J W Pew, 310 Pine.	Dec 3.	Dec 3.
Eureka Con M Co, California.	25.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	N T Mason, 303 Montgomery.	N T Mason, 303 Montgomery.	Dec 3.	Dec 3.
Great Western Quicksilver M Co.	25.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	A Halsey, 328 Montgomery.	A Halsey, 328 Montgomery.	Oct 1.	Oct 1.
Idaho M Co, Grass Valley.	3.00c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	Grass Valley.	Grass Valley.	Aug 4.	Aug 4.
Mayflower Gravel M Co, California.	10.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	D M Kent, 330 Pine.	D M Kent, 330 Pine.	Aug 13.	Aug 13.
Pacific Coast Borax Co, California.	1.10c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	J W Pew, 310 Pine.	J W Pew, 310 Pine.	Dec 13.	Dec 13.
Standard Cons M Co, California.	10.25c.	Nov 4, Dec 3, 39 Montgomery.	Nov 4, Dec 3, 39 Montgomery.	J W Pew, 310 Pine.	J W Pew, 310 Pine.	Oct 26.	Oct 26.

mechanics, one of the most important in the institution. For over two years he assumed practically all of the duties of the department of physics.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

ARIZONA MINES.		Dr. Cr.		Julia.	
Crocker.	\$ 510.	Justice.	\$4,735.	—	—
Locomotive.	\$ 533.	Kentuck.	—	5,140.	—
Peer.	2,475.	Lady Washington.	—	9,417.	—
Peerless.	—	Merced.	—	10,611.	—
Silver King.	—	7,497.	Use dental.	379.	—
Welson.	—	5,293.	Opbir.	13,508.	—
BODIE MINES.		868.		Overman.	
Bodie.	20,34.	Potosi.	3,341.	—	—
Bulwer.	6,403.	Seg. Belcher.	1,740.	—	—
Chollar.	7,883.	Sec pion.	1,770.	—	—
Stardard.	31,973.	Sierra Nevada.	25,534.	—	—
Syndicate.	2,253.	Union.	2,551.	—	—
COMSTOCK MINES.		—		—	
Alpha.	606.	Utah.	8,839.	—	—
Alta.	20,132.	TUSCARORA MINES.		—	—
Andes.	8,557.	Belle Isle.	10,573.	—	—
Belcher.	2,222.	Commonwealth.	2,413.	—	—
Best & Belcher.	205.	D 4 Monte.	9,128.	—	—
Bullion.	14,373.	Diana.	81.	—	—
Caledonia.	11,338.	Grand Prize.	3,944.	—	—
Challenge.	131.	Independence.	20,897.	—	—
Chollar.	21,189.	Nevada.	16,639.	—	—
Confidence.	19,131.	Nevada Queen.	16,639.	—	—
Con. Cal. & Va.	77,168.	North Belle Isle.	24,957.	—	—
Con. Imperial.	27,344.	N Commonwealth.	11,416.	—	—
Con. New York.	12,979.	—	18,000.	—	—
Crown Point.	16,377.	MISCELLANEOUS MINES		—	—
Exchequer.	10,270.	—	—	—	—
East Sierra Nevada.	793.	Eureka.	48,721.	—	—
Gould & Curry.	690.	Holmes.	18,271.	—	—
Hale & Norcross.	30,246.	—	5,254.	—	—

Eastern Metal Markets.

By Telegraph.

NEW YORK, December 9.—The following are the closing prices the past week:

Silver in Silver.		London.		New York.		Copper.		Lead.		Tin.	
Thursday.	44 1/2	95 1/2	11 10	4 25	19 90	—	—	—	—	—	—
Friday.	44 1/2	94 1/2	11 10	4 25	19 90	—	—	—	—	—	—
Saturday.	44 1/2	94 1/2	11 10	4 25	19 90	—	—	—	—	—	—
Sunday.	44 1/2	94 1/2	11 10	4 25	19 90	—	—	—	—	—	—
Tuesday.	44 1/2	94 1/2	11 10	4 25	19 90	—	—	—	—	—	—
Wednesday.	44 1/2	94 1/2	10 75	4 25	19 90	—	—	—	—	—	—

Borax is steady at combination prices. Tin continues to fluctuate. Iron has a firmer tone. Lead is barely steady, as is copper. Quicksilver is strong both here and in Europe.

Splendid Holiday Art Gifts.

L. Prang & Co. of Boston, who have led these many years in their American art publications, have this year a more than usual attractive variety of really superior designs and finely executed pictorial prints, as shown by specimens sent us by J. H. Doherty, S. F., agent, No. 527 Commercial St. All first-class stores will no doubt be well supplied with Prang's latest and superior productions, in which Americans can all feel a special pride.

The highly artistic and elegant character of the designs fully sustain, if they do not surpass the reputation of this house in this direction in past seasons. The line is distinctively American, not only as to the original designs, which were executed by foremost American artists, and lithographed and printed in their Fine Art Establishment in Boston, but also as to the style and character of the art hooks, hand-painted and hand-decorated mounts, shape novelties, calendars, etc., all of which were designed and made under their personal supervision.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
Geo. Wilson—Sacramento.
J. H. Crockett—Ferry Co.
J. CLAUDE A. DUTTON—San Lucas, Cal.
G. R. GILL—Cambridge, Cal.
FRANK A. SWERTZER—Colusa, Cal.
W. E. BRAYTON—San Pedro Co.
J. T. AUSTIN—Tulare County.
WM. T. HEAD—Cloverdale, Cal.
W. W. MARSH—Nevada.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	
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PARKE & LACY COMPANY,

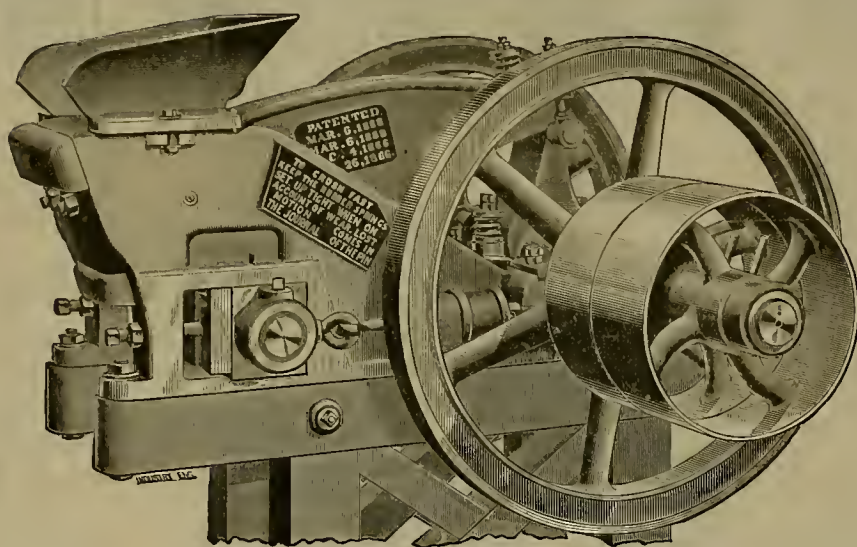
MINING, MILL and GENERAL MACHINERY.

ENGINES,
BOILERS.
PUMPS.

STAMP MILLS,
PULVERIZERS,
CRUSHING ROLLS.

ROCK BREAKERS,
CONCENTRATORS,
WET AND DRY JIGS.

BULLOCK DIAMOND DRILLS.



DODGE IMPROVED ROCK BREAKER.

INGERSOLL - SERGEANT
ROCK DRILLS,
AIR COMPRESSORS
— AND —
COAL MINING MACHINERY.

WATER WHEELS,
IRRIGATING PUMPS.

SAW MILLS,
PLANING MILLS,
MACHINE TOOLS.

MILL AND MINE SUPPLIES.

GENERAL AGENT FOR WESTINGHOUSE AUTOMATIC ENGINES.

21 and 23 Fremont St., San Francisco, Cal.

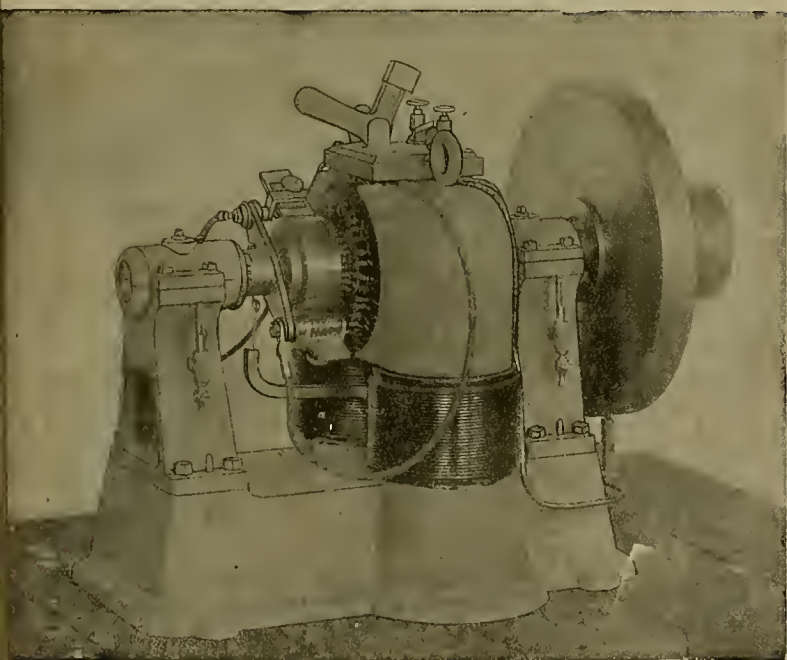
187 and 189 Clarence St., Sydney, N. S. W.

ELECTRICAL ENGINEERING CO.,

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Dynamos and Electric Motors

FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.



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ELECTRIC APPARATUS.

The Dynamos and Motors manufactured by this Company develop the highest mechanical efficiency; they require little or no attention, are almost noiseless, and run with an entire absence of sparks at the brushes, rendering the daily trimming of brushes unnecessary.

Electric Power Apparatus for Quartz Mills, Hoisting, Pumping, Drilling, and all Mining Work, where Long Distance Transmission is desired, a Specialty.

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OF CALIFORNIA & DAVIS STS. — C. B. JOHNSON & CO. — SAN FRANCISCO.

L. C. MARSHUTZ.

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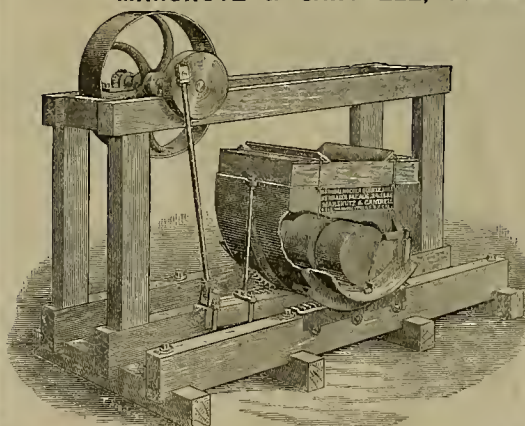
AMALGAMATING MACHINES. CASTINGS AND FORGINGS Of Every Description
ALL WORK TESTED AND GUARANTEED.

IMPROVED PORTABLE HOISTING ENGINES.

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The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

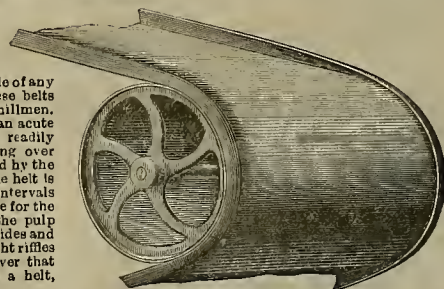
1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or any other ore crushing machines now before the public.

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We have now made arrangements to have our new Concentrating Belt manufactured in San Francisco; we can therefore fill all orders on short notice. The length and width of these belts are the same as is used on the Frue or Triumph Concentrating Machines, but can be made of any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight rifles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth.



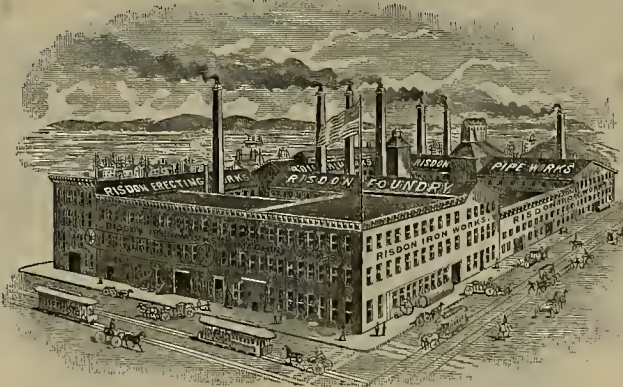
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Direct Acting Hoisting Engines,
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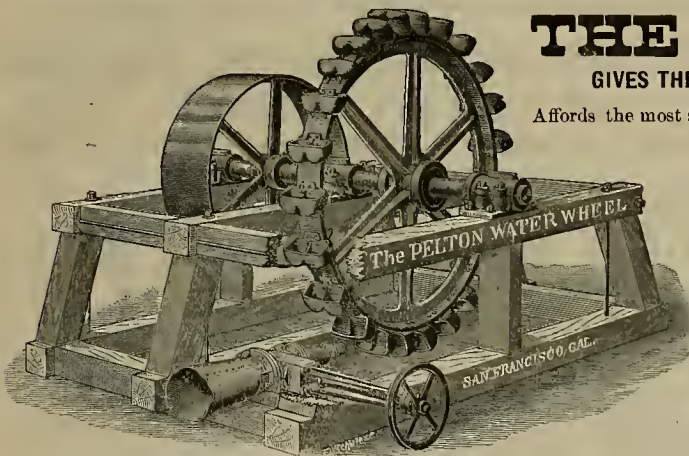
Heine Sectional Safety Boilers,
Tubular, Firebox and Flue Boilers,
Gold Stamp Mills,
Silver stamp Mills,
Bryan Roller Works,
Concentrating Mills,
Chlorination Works,
Water-Jacket Smelting Furnaces,
Roasting Furnaces,
Copper-Smelting Works,
Lead-Silver Smelting Works,
Tulloch Concentrators,
Sugar Machinery,
Cable Road Machinery,
Electric Road Machinery,
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Mill & Mining Appliances of every description.
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Designs and Patterns of the Largest and Most Complete Mining Machinery.

High Pressure, Condensing, Compound, Triple and Quadruple Expansion Marine Engines. Marine Boilers of every type.
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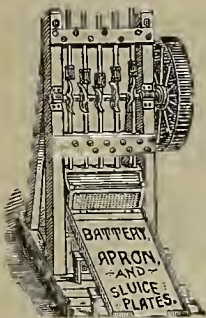
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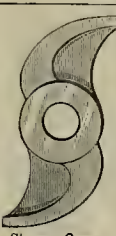
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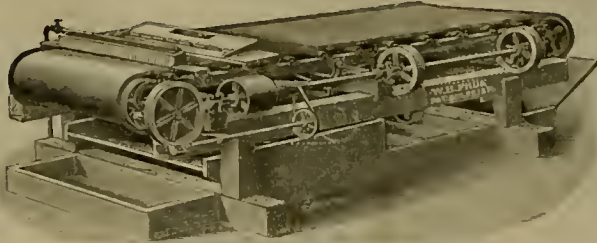
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We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

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The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880
September 18, 1883; July 24, 1888;
and March 31, 1891.

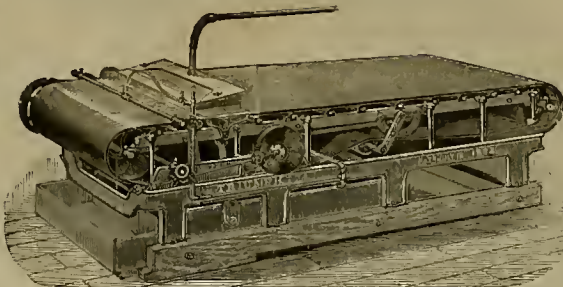
Price of Plain Belt Frue Vanner, \$575, f. o. b.
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ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs," for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - \$550 f. o. b.



(PATENTED.)
Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal. }
GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices.

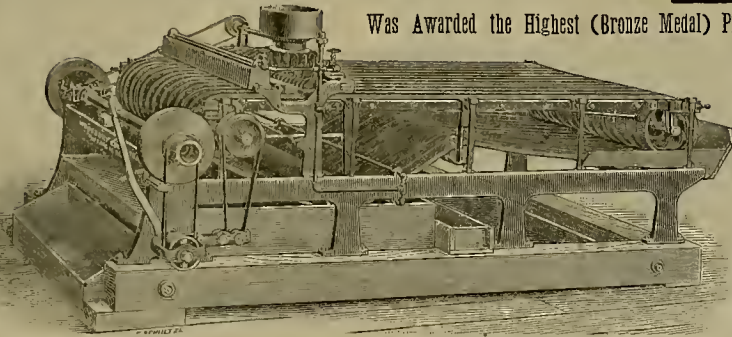
Signed) Supt North Star and Original Empire Mining Co
DAVID MCKAY, JR.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS.

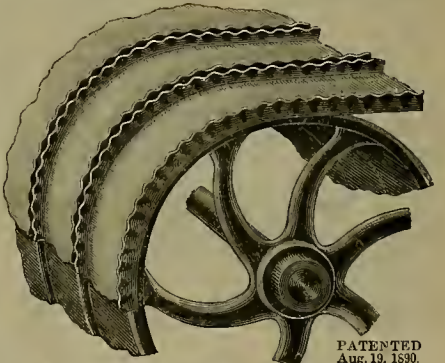
Was Awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891.



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With One-Half Less Power and Occupying Less than
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Built of Best Steel and Wrought Iron.
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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. This excess in length of material effectually prevents the edges from cracking. Plain edge belts have to stretch about one inch to the foot as they pass around the drums. This continuous stretch cracks the edges. The improved belt obviates that difficulty.



GEO. E. WOODBURY, Man'fr, 213 to 219 First St., San Francisco.



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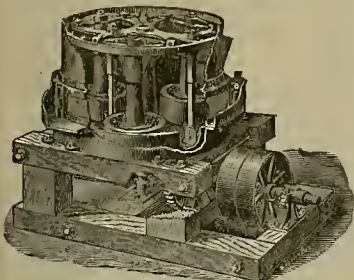
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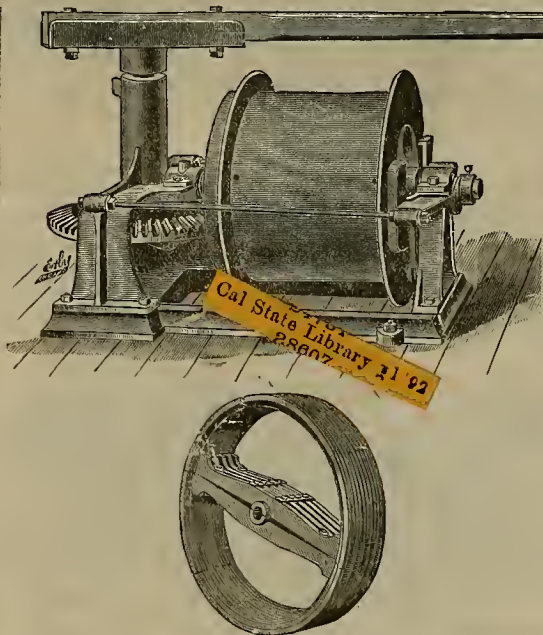
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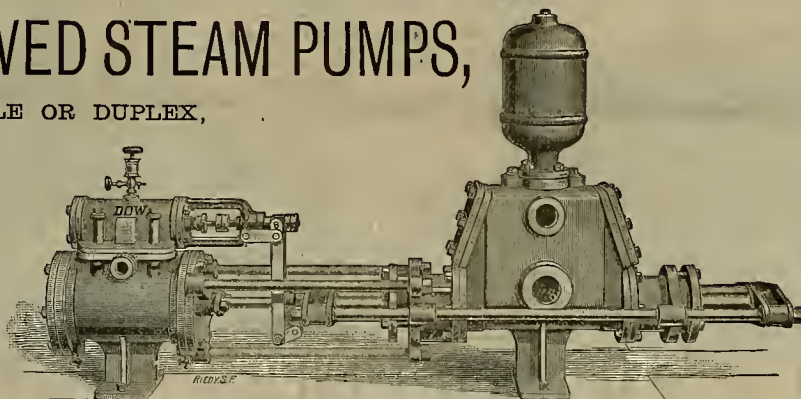
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VOL. LXIII.—Number 25.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 19, 1891.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Coal-Preparing Machinery.

When anthracite coal first comes from the mine, it is not marketable. The "run of the mine" cannot, as in the case of bituminous coal, be sold. With anthracite, it is deemed important to have the lumps as nearly of uniform size as possible, so that between them a large amount of surface will remain exposed to the action of the air without checking the draught too much, or allowing enough air to pass to cool the coal below the ignition point. In other words, if the pieces of coal of the size of a chestnut and smaller are mixed with lumps of the size of an egg, they fill the air passages and prevent a free draught. It has long been recognized, therefore, that one of the most important points in the preparation is to have a uniform sizing, and also to make as large a number of sizes as can be produced without too great expense. It is also essential to remove all dust, which depreciates the value of the coal on the market.

Mixed with the pure coal, large amounts of slate, "slate coal" and "bony coal," generally occur. The problem is to remove these impurities as completely as possible. In recent numbers of the PRESS, within the past few months, we have described many of the mechanical appliances for removing slate, and preparing the coal, the illustrations having been taken from a paper read before the Institute of Mining Engineers, by Eckley B. Cox of Drifton, Pa.

The "Iron Breaker" at Drifton is a structure where the preparation of the coal for the market is carried on. Two veins are here given from photographs of the breaker.

Plate XXXVIII was taken from a point southwest of the breaker and representing the breaker when finished. It shows the harney and gunboat on the plane; and on the left-hand

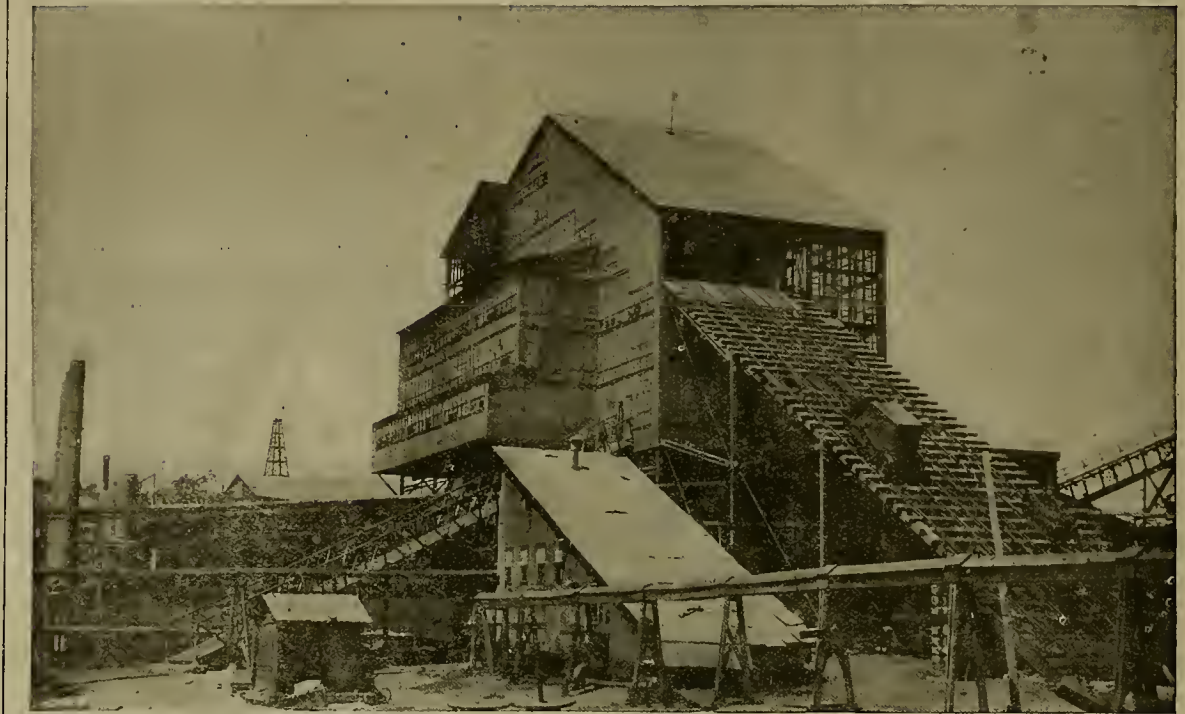


FIG. 1.—COMPLETED IRON BREAKER, FROM THE SOUTHWEST, SHOWING PLANE AND JIG-HOUSE.

side of the breaker, the jig-house, which projects from the main line of the building, is very distinctly shown. The truss bridge running from the ground to the top pockets (about 26 feet from the ground) is the main entrance to the breaker for the workmen. The advantage of this plane is that it brings the men to the

ground beyond the cars and machinery, thus diminishing the risk of accidents. Plate 2 is a view taken from a point southeast of the breaker. This was taken when the breaker was only partially completed. It shows on the right hand the lump and steamboat chutes very distinctly, and the plane in its unfinished

condition, with the girders carrying the sills. The large wooden structure to the right is the settling tank for settling the slimes coming from the breaker. The water, after depositing in them the most of the fine coal and slimes, is carried off in pipes. It will be noticed in both these plates, particularly in plate 2, that in consequence of the great number of windows all around the breaker, one can see through it distinctly. The thoroughness with which the interior is lighted will therefore be evident. The breaker is also equipped with an incandescent electric-light plant of 200 lamps of 16-candle power.

The iron breaker is a pin-connected structure, the posts being of cast iron, the struts generally of cast iron and the tie-rods of wrought iron. Most of the large beams are riveted plate girders; the smaller are rolled iron. There are three large lathes or truss girders. The pockets for the prepared sizes of coal are eight in number, and there are two loading chutes. The plane on which the coal is hoisted carries the tracks for the cars. The main structure, or that part of the building which contains the machinery is built immediately over the pockets. The foundations under the whole breaker had to be put in with great care. The grating screens, jigs (which we have previously described) and all the other separating and cleaning machines are in this building. There are no dark corners in the breaker, particularly around the machinery, which is very accessible. All the stairways are of iron, as well as the gangways and platforms.

The height of the breaker from the railroad track to the peaks of the roof is 91½ feet; to the dump, 79 feet. The greatest amount of coal that has been passed through and cleaned in the breaker is a little over 260 tons per hour.

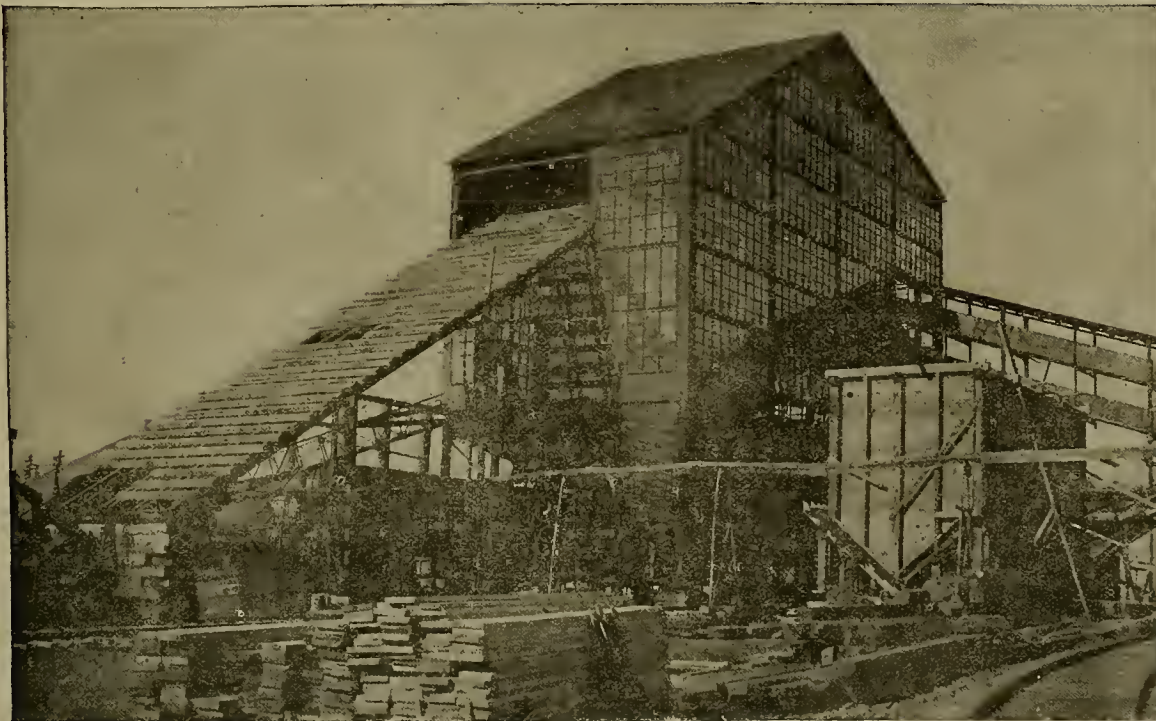


FIG. 2.—VIEW OF BREAKER FOR PREPARING ANTHRACITE COAL, SHOWING SETTLING-TANK AND LUMP-CHUTE.

The Dead Blue River Channel.

In the *Overland Monthly* for December, John S. Hittell, a writer of much prominence in this State, has an article treating of an ancient gold-bearing river channel which he supposes once ran at least from Eureka, Sierra county, to Placerville, El Dorado county, a distance of 60 miles, a due south course. This is the same "blue lead" which all the early miners talked so much about and knew so little of. We had supposed that the theory of a "great blue gravel channel" sweeping from North to South along the shoulder of the Sierra Nevada had, generally, been relegated to the shadows of unproven speculation that compass and obscure the old "mother lode" theory.

Observation of the surface along the northern portion of the alleged blue channel, and some knowledge of the various worked channels, led us, long since, to reject the probability of there ever having been such a river as the early miners supposed. The reasons for such rejection are many and cannot well be made plain to those who have not observed closely the evidences furnished by the extensive explorations made since the "great blue lead" was first imagined.

As a few of the reasons it may be suggested that the grade of the supposed channel is too light—30 feet to the mile is not enough—the average grade of channels, as demonstrated by actual workings, being not far from 150 feet to the mile. In places, from one ridge to another, there is no grade at all.

If such a "blue channel" had ever existed, it would be reasonable to suppose that we should find tributary streams putting in from the west as well as from the east. This we do not find. Every channel lying to the west of the Downieville-Placerville line grades southwesterly, away from the supposed channel, and this grade was not caused by elevation of the country, because these streams all ran southwesterly—that being their general course, as is shown by the "shingling" of flat rocks on the ridges, etc.

No necessity exists for such a channel as imagined. It is not conceivable that the drainage system of a mountainous section could have so been shaped, there being nothing like it known. It can be shown, conclusively, that many, if not most, of the gold-bearing gravel channels had their sources to the eastward of the line of the "dead blue," and can be traced to the westward of that line.

The ancient system of drainage, as exemplified by the dead rivers, has its almost exact counterpart in the live mountain rivers and their tributaries, differing only, as they would naturally, from one being only a few hundred feet below the average level of the country, and the modern two thousand feet below on the suggested line. The apparent suggestion of a channel running south is disposed of by observing that a line drawn from the North Yuba at Downieville to the south fork of the American river near Placerville will just touch the hot-toms of all the larger streams between these points, giving exactly the grade given to the "dead blue." Suppose these streams filled with gravel and covered with mud lava; suppose sufficient time to have elapsed so that what are now main ridges of bedrock have been eroded to a point two thousand feet below the present main streams, we should then have a series of ridges capped with gravel, extending from Downieville to Placerville, the bedrock underneath which gravel showing exactly the grade now given the "dead blue," and the geologist of that age would be in possession of the same evidences that a great river ran north to south along the range ages before the destruction of humanity by fire, that present investigators have of the existence of the "dead blue" running in the same direction during the pliocene period. If not, why not?

We do not lay claim to much geological knowledge, but observation, extending over a period of 30 years, has convinced us that during the latter part of the pleistocene period, water ran down hill. Given a range of mountains extending in a south by east direction, auriferous quartz ledges, plenty of water and time, and nearly all the phenomena of the deposition of gold and gravel in the pleistocene formation is "present or accounted for." At the beginning of the time when the gravel was deposited, the western slope of the Sierra was, almost beyond question, an uneven plateau, inclined to the southwest, with no deep depressions or high elevations, locally speaking, but as a whole, much more elevated above the sea than are the main ridges to-day, seamed with gold-bearing quartz veins. Then the rains and snows fell and the process of erosion, which formed and filled the channels with quartz gravel, began.

This erosion continued until all the gold and gravel that we find in the dead rivers was laid down just as we find it to-day. Then there came a change. From somewhere to the eastward came vast quantities of mud, which we call pipeclay, and filled the channel of the larger streams at least. That was the end of the so-called pliocene channels as factors in a drainage system. From that day to this, they have remained a sealed page in the book of the universe. Either at the time, or soon after the flow of pipeclay, some slight tilting of the slope occurred—just enough to cause the drainage of this section to tend more to the south, and form new channels, which cut the older channels at various angles. Later, the water from some cause, now unknown, tended still more to the eastward, forming a third drainage system that

cut away the channels of both preceding systems, in places. No pipeclay overlies either of the two secondary channels.

In the fullness of time, a great pouring of mud lava took place, filling all the depressions, but not covering of ridges between the streams. Afterward, from causes not known to us, the waters that fell upon the just and upon the unjust began to find their way to the sea along the line of parting between the lava and the bedrock, and the latter being the softer, wore more rapidly than the former, until it came to pass that the waters of the principal streams ran south of west instead of west of south, as at first, and they continue so to run to this day. While the foregoing may not be applicable to every locality in every particular, it is the story revealed to those who inquire within and without along the lines of development in this county during the past 40 years.—*Mt. Messenger (Sierra Co.)*

Vertical Mining Shafts.

In mining in the Grass Valley district, says the *Union*, it has been the prevailing custom to sink inclined shafts on the quartz veins for greater convenience in prospecting and extracting the ore. This has also been considered to be the most feasible plan as the veins as a rule are not wide, and the "country rock" is generally sufficiently hard to start without expensive timbering. This mode of mining will continue in the future, but it is becoming evident that in very deep working it will become a matter of economy to sink vertical shafts. Take for instance the North Star and Empire, where the inclination of the veins do not exceed 30 degrees. The shaft of the first named mine is now nearly down to the 2300 foot level, and yet the vertical depth will be less than 800 feet. The Empire is down to the 2000 foot level, with a vertical depth of say 650 feet. This necessitates a long line of pump columns, and a severe strain on the pump rods, which makes an exacting service upon the machinery, which would be materially lessened if the mines were provided with vertical shafts, and would also be a saving both in time and money in pumping and in hoisting the ores to the surface. The experience of the last few years has been favorable to deep mining in this district, which has given mining men new and more progressive ideas as to the value and permanency of the district, and they realize that they must improve on the old modes of working by minimizing expenses. Take as an example the North Star mine. By the first of the coming year there will have been four new levels opened within thirteen months time, which represents the sinking of 400 feet in the shaft. Should a like amount of sinking be done next year the 2700 level would be nearly reached, and it is evident that the powerful machinery would be taxed to the utmost, and additional expense for heavier machinery would have to be incurred, or else a vertical shaft sunk. It is altogether likely that the latter will be done, as whatever the first cost of the improvement, it will eventuate in a large saving, as well as facilitating all of the under ground operations. It may be accepted as a fact that in deep working in this district the time is not distant when the operating of mines by means of vertical shafts will be a popular mode of mining.

RAILROAD AND LAND GRANTS.—Secretary Noble, in his annual report, says: The matter of the adjustment of railroad land grants, as contemplated by the Act of March 3, 1887, says the report, presents for decision many varied and important questions, and from the numerous interests presented and the large values involved, much care and research are necessary for a proper disposition of the same, and from the magnitude of the work, progress is necessarily slow. The chief causes of delay are lack of surveys and the mineral complications—that is, the actual conditions of the lands inside railroad limits with regard to mineral deposits. The position of the department on this question is that the discovery of the mineral character of land at any time prior to the issuance of patent therefor effectually excludes such land from a railroad grant that contains a provision reserving all mineral lands therefrom. The Supreme Court of the United States must eventually settle the question. In the meantime, patents will be refused for all lands deemed to be mineral within the provisions of the statute.

THE WOODBURY CONCENTRATOR.—W. B. Farwell, Supt. of the Gold Mountain mine, Amador county, writes a letter to Geo. E. Woodbury, inventor of the Woodbury concentrator, in which he says: "The two 'Woodbury concentrators' obtained from you in August last by the Gold Mountain Mining Co., have been running steadily at Quartz Mountain, in this county, since the first week in September. Up to that time, all efforts that had been made at Quartz Mountain to save the very valuable sulphurets that are found there had resulted in failure. I am happy to be able to inform you that, with two of your machines, the mill has been run since it first started up in September with fine success. The machines save the sulphurets very closely and at a fine profit. In brief, they are a perfect success where all others have been a perfect failure. The company is now putting in ten additional stamps and will use two more of your machines, regarding them as the very best concentrators that have ever yet been put upon the market."

Amador's Gold Product.

In answer to a correspondent who asks for the names of mines which have paid dividends in Amador county, the *Ledger* has this to say: The information which our correspondent calls for is next to impossible to obtain. Most of the companies operating along the mineral belt of Amador county are close corporations. All those organized with Eastern capital, except those listed on the New York Stock Board, are of this character. The output of bullion and the amount disbursed in dividends are, as a rule, kept secret. Perhaps it would be much more advantageous for the mining interests if it were otherwise. Outside of the Plymouth Consolidated, we do not know of a mining company in the county that makes a practice of publishing the bullion production and expenses. The truth is, mine-owners here are not engaged in trading in the stocks; they look for returns for their investments to actual surrender of gold from the quartz veins. Hence there is no motive of self-interest to prompt them to make public the yield of the precious metal. The only record of the production of our mines is the annual report from the Mint at San Francisco. This report gives the total yield of Amador county for 1890 at \$1,469,000. We have already published the detailed statement, but will republish the output of those mines yielding \$10,000 and over:

South Spring Hill Mining Co.	\$251,272 25
Kennedy Mining and Milling Co.	233,123 09
Zelle Mining Co.	169,334 33
Amador Reduction Works	122,036 91
Wildman	110,262 26
Keystone	72,773 65
Bunker Hill Gold Mining Co.	58,930 13
Gover	50,510 21
Plymouth Con. Mining Co.	54,550 00
Grass Valley Plume and Hydraulic	40,000 00
Purrrington ditch	30,000 00
Lambing Gravel Mining Co.	18,571 43
River gold	16,010 00
Lincoln Mining Co.	10,000 00

The amount credited to the Amador Reduction Works must be added to the yield of the South Spring Hill, Wildman, Keystone, Gover and a few other mines, being the yield from the sulphurets treated at those works. Of the above list, at least seven or eight must be dividend-paying propositions. True, our mines have not been so prolific during the last few years as in some years in the past, but a contribution of a million and a half to the world's stock of gold in one year is by no means a poor record for a mineral region 20 miles in length from north to south. One thing is certain—it has cost far less than that sum to extract this vast yield, and this much can doubtless be said of Amador's mining history from the beginning to the present time. There are few gold mining countries of which this can be said. The Comstock vein—the mightiest bullion producer the United States has ever seen—has surrendered far less than a dollar for every dollar that has been expended. At the present time, there is not a solitary mine on that famous lode that is paying expenses. They are all assessment propositions, except the Con. Virginia, which is fast working up its surplus, and hide fair to be in the procession with the balance in a few months.

The Plymouth Consolidated has paid \$2,280,000, most of it within the last ten years. The Keystone has paid monthly dividends for nearly 30 years, some of them as high as \$40,000, the aggregate reaching into the millions. An assessment levied two months ago is the first in the history of that mine. The South Spring Hill—a mine operated by New England capital—has paid dividends for years. In its palmiest days, the owners were offered—so it was freely reported—at the rate of between one and two millions for the property—a sum far exceeding all the Eastern capital which has been expended in mining enterprises in this county. It is true, it has not yielded dividends the last few months, but there are good reasons for believing that its prosperous days will return ere long. The Mahoney, Gover, Wildman, Kennedy and Zelle have all proved paying mines. In the past year, the Kennedy has loomed up as one of the grandest mines the county has produced. In proportion to the number of stamps in motion—40—its output far exceeds that of the Plymouth Consolidated in its best days. It has paid regular monthly dividends, some as high as \$40,000. We do not see any grounds for murmuring at Amador county as a field for mining enterprise, either viewed from her past or present record. As for the intimation that our gold-bearing quartz veins are exhausted, the idea will not be entertained for a moment by those at all conversant with the situation. Our auriferous ground has merely been scratched over. The work done is not to be compared with what remains to be done. From the extent of territory within the limits of the mother lode, still untouched, it is safe to assert that there is infinitely more gold in the ground than has been taken out, and at the present rate of prospecting, half a century hence will find Amador county practically unimpaired as a contributor to the supply of gold.

DR. C. J. EAMES expects to have his San Diego steel works in operation by the first of the coming year. Negotiations have lately been completed by which iron will be shipped by water to the works direct from the Tepic-Atete mine at San Ysidro, Lower California, 50 miles south of Ensenada. The vein averages 125 feet in width and has been traced on the surface for a distance of over 2000 feet. Dr. Eames says at least 85,000 tons of metalloiferous ore is in sight, which averages 68 per cent of iron.

Mr. Mackay on Comstock Milling.

One of the witnesses in the Hale and Norcross suit last week was John W. Mackay, the well-known mining millionaire. The testimony was of interest to many.

"You have been engaged in mining many years?" he was asked.

"Nearly all my life."

"You have a large interest in the Con. Virginia mine and the Comstock Milling Co., and are acquainted with their workings, and that of the whole Comstock generally?"

"I have and I am."

"What percentage of pulp assays are returned at the Con. Virginia?"

"About 75 per cent. Sometimes it is higher and again lower."

"Has it ever been 85 or 88 per cent?"

"Frequently."

"If the car-sample assay of 1259 tons of ore averaged \$72.12, what ought the battery sample to be?"

"The battery assay ought to be \$62 or \$63."

"If the battery assay of this ore was \$40 66, you would consider it too low, would you not?"

"I certainly would."

"In working about 4000 tons of ore whose car samples averaged about \$42 and the battery only returned \$27.27, would you consider that too low?"

"There might be a little base ore in the assay, but if there was not, the battery ought to be \$32 or \$33. There should not be more than a difference of \$8 to \$10 per ton between the assays."

"If the 1259 tons were worth by our sample \$113 518 41 and the gross bullion returned was \$40,471.50, would you think it was properly milled?"

"I would not, because there is too great a discrepancy."

Mr. Baggett, continuing to read from the bullion record of the Hale and Norcross, asked:

"If in 3973 tons, whose car sample assay value was \$222,711.30, the gross bullion return was \$73,097.77 yield, would you think that the ore had been properly milled?"

"I would not. That difference is too great."

Car Samples and Battery Samples.

In reply to questions by Mr. Wood the witness said he had not owned any interest in Hale and Norcross for many years and that he based his opinion of the working of ores from the Con. Virginia mine.

"Assuming that car sample and pulp assays were honestly taken and they differ, which do you consider the best assay?" was asked.

"The pulp or battery assay. Even the assays differ and so do the battery samples."

Mr. Baggett asked if he had not known the gross output to exceed the battery assay.

"I have known it to do so—that is, the mill has returned higher than the battery assay."

"Taking an average of between 40,000 and 50,000 tons of ore would not the car samples, if properly taken, approximate the value of the ore?"

"They would."

Every one in the courtroom displayed a deep interest in Mr. Mackay's testimony.

Judge Hebbard suddenly turned to him and interrupting a question which Mr. Baggett was about to propound, asked:

"How low a grade of ore on the Comstock would it pay to work?"

"Probably \$14 or \$15 per ton."

"Then there would be a loss to the mine in working all ores under that value," said the court.

"I believe there would be."

"Mr. Mackay, what is a fair rate for milling Comstock ores where there is no contract?"

"It is hardly possible to say definitely, as much depends upon the grade and character of the ore and the loss of quicksilver. Ore that is worth \$60 to the ton costs more to mill than \$20 ore, and still lower grades can be worked more cheaply. I should say that \$5.50 to \$6 for low grade and \$6 to \$7 for higher is a fair price. Up to \$36 there is an increase of about \$1 a ton in the cost of milling."

"Isn't it a part of the compensation for working ores to appropriate the tailings?" asked Mr. Wood.

"I so consider it."

"What do you call tailings?" interjected Mr. Baggett.

"That material which is passed through the amalgamating pans."

"Does that include the slimes?"

"I consider them all the same thing."

Milling Customs.

"By what right as a millman would you claim those tailings?"

"In the first place it is a custom, and in the next, where the mill has agreed to return 65 per cent of their assays, they are allowed to retain the rest."

"Did not that custom grow out of early contracts on the Comstock, where the mill was required to return a certain percentage of mine assays?"

"It did."

"If there was no representative of the mine at the mill, could not the mill-owners dishonestly take a large proportion of the value of the ore?"

"They couldn't do it and work to the assay of the mine, but they might take it all if the ore was dishonestly worked, and no check placed upon them. It is the duty of the superintendent to exact a certain percentage of mine as-

says from the ore, and if that is not done, there is no protection for the mine."

Judge Hebbard asked what was the duty of a superintendent of a mine in the shipment of ore.

"The superintendent should have oar, hatchery and settlers made for comparison, and then see that he gets proper returns," said the witness. "He is not to look out for the shipment of bullion to the Mint."

"If you owned a mine that shipped ore which assayed \$70 per ton, and the mill only returned \$40, would you not look after it?" "I would look to it at once myself. I would not wait a day."

Mr. Biggett asked the witness as to what checks as a mine-owner he would put on a mill in which he had no interest, to which he replied that he would give no ore to the millmen unless he knew them to be honest, and as a business proposition he would see that there was not much discrepancy between the mine and mill assays, or he would know the reason why. From the general nature of the business, the mine was forced to place a great deal of confidence in the mill.

The President's Message.

The message to Congress of Benjamin Harrison, President of the United States, is a document far too lengthy for publication in our columns. A large portion is devoted to recapitulation of department reports and information already familiar to the public. Among other things, he recommends that a full trial be given to the present silver law, under which the Government is now buying and putting out of the market the equivalent of the entire production of our silver mines. He holds that the most effectual way of creating a European sentiment in favor of a larger use of silver is to accumulate gold in the United States. He does not yet find a public sentiment in Europe which will warrant him in proposing an international conference on the silver question.

The President deems the completion of the Nicaragua canal important enough to warrant the extension of aid by our Government by guaranteeing its bonds, or even by direct appropriation from the Treasury, should other means fail, of course taking measures to protect the rights and interests of the Government.

On the subjects of coast defense and navy buildings, the President is fully abreast of the Department officers having charge of those matters.

Irrigation in the arid region is treated briefly, but it is held that the danger of corporate control of water is great and that the General Government should not part with its ownership of water sources, reservoir sites, etc., either to States or Territories, except upon such conditions as will ensure to the interests of settlers.

The President recommends additional legislation to cure present defects in the Chinese Exclusion Act, especially regarding the deportation of those caught entering the country unlawfully.

On the Chilean trouble he accepts fully the theory and statements of our representatives regarding the attack upon the Baltimore's sailors, but says he has no official advice that the Chilean investigation is nearly completed, and an adequate and satisfactory response will be made. If disappointed in this, he will at once, in a special message, bring the matter before Congress for action.

A Nevada Enterprise.

The people of Nevada are gradually awakening to the knowledge that by the adoption of irrigation upon a large scale, a surer source of wealth will be found than in all the mines that have ever been discovered there. A plan is now under way for the irrigation of a large tract of land in the vicinity of Hawthorne. It is proposed to divert the water of a number of streams which at present empty into Mono lake, and to conduct them into a storage reservoir, a site for which has been found in a valley bearing the euphonious name of Whisky Flat. Below that reservoir is some 50,000 acres of fertile land that only needs the aid of irrigation to become highly productive. It is estimated that the entire work will not cost to exceed \$500,000, and it is proposed to bond the lands to be benefited in order to obtain the necessary capital.

ALONG THE COLUMBIA.—The course of the Columbia river furnishes an almost limitless panorama of entrancing views. We have adorned our columns from year to year with reproductions of camera-catches in this rich field, and yet the supply is abundant. Upon this page is a striking view where the railway passes between two vast rock-masses known as the Pillars. These are wonderful natural erections, and the lesser one compensates for its smaller stature by bearing upon its crest a forest tree of considerable size, finding nourishment in the gradual accretions of soil which rock disintegration, clouds and winged contrivances bring to its support. It is a perilous situation, but the tree has grown to it and secured a firm footing.

Mines in the Desert.

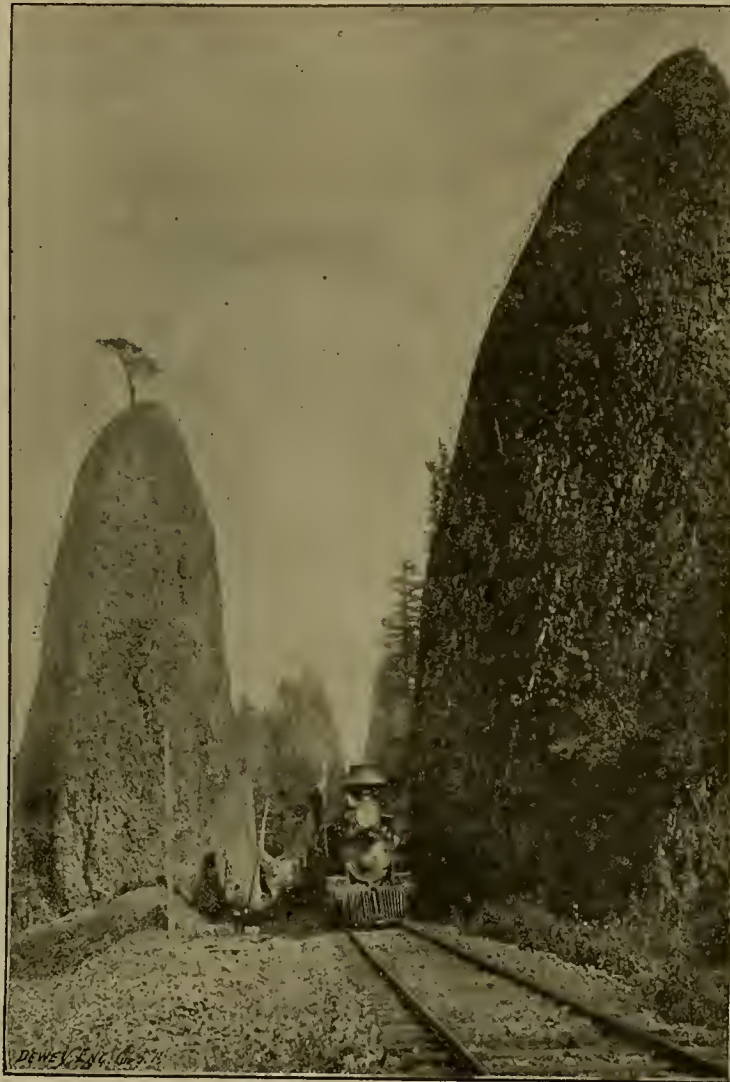
A correspondent of the *San Diegoan*, writing from Dos Cabezas, Great Colorado desert, says: This portion of San Diego county is receiving a search for precious metals at the present time unequalled in the annals of the county's history. Prospectors are daily to be seen at Indian Wells, New River and the Alimos, and at various other points where water can be got at.

The great Salton sea, at one time the country's talk, is fast disappearing and the same old desert looks as natural as usual. True the overflood has had a beneficial effect in the way of prospecting, as miners reached certain desirable points which they otherwise could not have done in the absence of water, and every prospector I have met agrees that they could not discover that phantom ship.

Signal mountain appears to be the prospective point, and in my view is the most desirable for very good reasons. I have seen some very nice specimens carrying silver in goodly quantities, and one piece shown me was as perfect a chunk of horn silver as I have ever seen. In

rigger," on the way to Portland, which will give him something to talk about with his fellow-travelers on the way when he returns.

FREE COINAGE BILL.—Senator Stewart put in his bill for the free coinage of silver last week, and it proved a very brief but very pointed document. It provides that the unit of value in the United States shall be \$1, and the same may be coined of 412½ grains of standard silver or 25.8 grains of standard gold, and these coins shall be legal tender for all public and private debts. Any owner of silver or gold bullion may deposit it in any mint, where it will be formed into standard dollars or gold coins free of charge; but it shall be lawful to refuse any deposit of less value than \$100, or any bullion so heavy as to be unworkable for the purposes of the mint. Section 3 of the Act of 1878, to authorize the coinage of a standard silver dollar, is made applicable to coinage under this Act. This relates to the issue of certificates, and Senator Stewart's bill provides that the certificates shall be of denominations of not less than \$1 nor more than \$10,000, re-



ALONG THE COLUMBIA—THE PILLARS.

fact, I am sensible enough to know that I was at one time guided to Wheeler's exploring party, under Captain Birglin, and in that capacity found some nice specimens of silver, but the Government would not wait for me to prospect, so I had to march away. The surroundings, country, ground and formation, give sure indications that quantities of silver and gold exist at Signal mountain, or in the immediate vicinity. True, so far as my knowledge extends, there has been no extensive ledge located, but it is evident that one is to be found here, as great quantities of float is to be found for several miles around the mountain, but so far it is only a matter of conjecture from whence they emanated. The developments recently made are on the American side. In all likelihood they may extend to Mexico, as the quartz to be found in Mexico is the facsimile of that discovered on the American side. A stiff upper lip, with plenty of energy, will unravel the whereabouts of the hidden treasures. I would willingly bet all my right in the world to come that it will be struck rich within three months.

Dos Cabezas and Cressas Creek have several men at work and claim that at the latter place they are taking out good rock.

MR. A. W. HAVENS, Secretary of the Consolidated Virginia and California mine, is off on a vacation trip to the northern coast. He went last week on a British sailing vessel, being nautically inclined and preferring a sailing voyage to one in a steamer. The "Admiral," as he is known among his intimates, hopes to meet with a storm while on the "square

deemable in standard coin. Owners of bullion deposited for coinage shall have the option to receive the coin or its equivalent in certificates, and such bullion shall be subsequently coined. The bill was not referred to a committee, as is usual, but was laid on the table, so Senator Stewart can call it up at any time.

MARBLE AND RICOILITE.—The Silver City (N. M.) *Enterprise* says: Prof. Merrill, of the Smithsonian Institute, Washington, has spent several days in and around the city examining the mining resources of this vicinity. He expressed himself as very agreeably surprised at the varied and valuable mineral products of this section. He inspected a mine west of Chloride Flat, which Prof. Warling classifies as that valuable mineral, ultramarine. It is only found in four other localities in the world, Persia, China, Siberia and Bucharia. Before the year 1814, this valuable pigment was worth its weight in gold, but in that year Christian Gmelin, a German professor of chemistry, discovered a method of producing an artificial compound, which now takes its place and has reduced the price from 15 to 20 cents per pound. While Prof. Merrill is the author of a standard work on architectural and ornamental stone, giving a history of them and localities where found, he had never heard of the great ricolite and marble quarries of Grant county, and spoke highly of the samples shown him. He made a trip to the ricolite quarries, and also to the marble quarries, with a view to incorporating in the next edition of his book a full and complete description of them.

The Bradford Mine Sold.

Much has been said the past month, says the *Callistogian* (Napa Co.) about the probability of the above-mentioned quicksilver mine being disposed of by the company, but nothing definite could be given to the public, as such information might interfere with the negotiations.

The mine was at first bonded to the New Almaden Co., and to satisfy them to a certain extent of the value of the property, work was done in the mine by a number of miners sent there by the New Almaden people. The developments resulting from this work were satisfactory. But when the subject was brought before the company for final action, they refused to purchase. J. B. Randol, business manager of the New Almaden Co., labored hard to induce the company to purchase the property, but they peremptorily refused to do so. Mr. Randol knew that the mine was valuable, and he told them that if they would not buy it, he would endeavor to do so himself with the aid of capitalists. With this object in view, the time for purchasing the mine was extended, and he began making efforts to secure assistance. Before the expiration of ten days, he had succeeded in associating with him for the purpose, D. O. Mills of New York and Thomas Bell, formerly interested in the New Idria quicksilver mine, and the Bradford mine, together with the real estate belonging to the Bradfords, was purchased. The amount paid for the mine we have been unable to learn, but no one opposes it to be less than \$250,000. The amount may be twice that sum. The old Bradford farm, with certain additions of real estate purchased the past few years, was sold to the new company for \$20,000.

Monday afternoon, Von Lsicht, from the New Almaden mine, who is to be superintendent of work at the Bradford mine, passed through Calistoga on his way to the new purchase, where he will probably ascertain what improvements should be made to secure the best results. Among these will no doubt be the construction of one or two new furnaces.

To-day an extra stage was necessary to convey to the mine a number of furnacemen, who are to begin work without delay. All the miners and furnacemen heretofore employed at the mine have been discharged, and will not be given employment there in the future. The expense for this is that old miners at the New Almaden must be provided for in preference to others.

The sale of the Bradford mine is the most important transaction in mining property thus far recorded for this portion of the State, and will no doubt result beneficially to all mining interests of the surrounding country.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

MEXICAN HIDALGO AND ZARAGOSA G. & S. M. Co., Dec. 1. Capital stock, \$50,000. Directors—C. H. Chambers, J. H. Cunningham, S. R. Norton, G. Bebe and D. M. Dille.

WESTERN DREDGING CO., Dec. 1. Capital stock, \$1,000,000. Directors—C. E. Gunn, C. L. Benton, J. Bruckman, E. L. Wagner and Chas. M. Shortridge.

STANDARD QUICKSILVER M. Co., Dec. 2. Capital stock, \$5,000,000. Directors—J. B. Reinsteint, M. S. Eisner, T. E. Ryan, F. J. Fleiter and F. W. Wallace.

FINE GOLD LAND AND WATER CO. (Fresno), Dec. 2. Object, to mine, build canals and flumes, etc. Capital stock, \$500,000. Directors—Wm. Helm, W. N. Ootbort, R. B. Johnson, W. H. McKenzie and S. N. Griffith.

SAN LUIS OBISPO IMPROVEMENT CO., Dec. 7. Capital stock, \$124,000. Directors—Melville W. Regensberger, Louis Cooks, W. Grosse, R. S. Wheeler, Frederick Sigmund, L. Simon, Ernst Keiser, J. A. Miller, Wolrod Winterberg, Henry Stern and G. A. Falkenstein.

SCHOONER ALICE COOKE CO., Dec. 7. Capital stock, \$48,000. Directors—J. W. Graham, W. H. Dimond, A. H. Higgins, W. G. Hill and F. J. Lowery.

SCHOONER ROBERT LEWERS CO., Dec. 7. Capital stock, \$48,000. Directors—J. W. Graham, W. H. Dimond, A. H. Higgins, W. G. Hill and F. J. Lowery.

PASO ROBLES AND CAYUCOS R. R. Co. San Luis Obispo, Dec. 7. Object, to build, operate and construct a railroad from Paso Robles to Cayucos, about 30 miles in length, to build and operate telegraph lines, etc. Capital stock, \$700,000. Directors—George R. Adams, H. Eppinger, E. A. Stowell and O. C. Bryant of Paso Robles; M. M. O'Shaughnessy and J. N. E. Wilson of S. F.; A. F. Jack of San Luis Obispo, and J. W. Watson and A. M. Hardie of Cayucos.

FRESNO ELECTRIC R. R. Co., Dec. 4. Capital stock, \$4,000,000. Directors—Marcus Follasky, J. R. White, Fulton G. Berry, Benjamin R. Woodworth, W. F. Chandler, Dr. Lewis Leach and Morris Messinger.

SAN FRANCISCO AND EASTERN R. R. Co., Dec. 7. Object, to construct and maintain a railroad from a point in Alameda county on the bay of San Francisco, opposite the city of San Francisco, through the counties of Alameda, Contra Costa, San Joaquin, Merced, Fresno and Tulare to Hanford, and through the El Tejon pass to Rogers, in Kern county, a distance of 380 miles; also from Hanford, in Tulare county, through Visalia and Walker's pass to Indian Wells, in Kern county, a distance of 100 miles. Capital stock, \$14,400,000, divided into 144,000 shares. Directors—J. R. Howell, C. W. McAfee, W. W. Belvin, H. J. Brady and C. L. Weller.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR QUEEN.—*Ledger*, Dec. 8: A force of four or five carpenters are at work repairing the mill of the Amador Queen in Hunt's Gulch. Mr. Graham, an expert miner, will be superintendent, and A. N. Peterson of Sutter Creek is engaged as millman. He is one of the best millmen in the State, and if there is gold in the rock in paying quantities, he is as likely to make it pay as any man that could be selected. Ten stamps are being fitted up first, and they are expected to be dropping by Christmas. The other ten will be repaired afterward. There is plenty of rock on hand to keep ten stamps going for some time. We were shown this week a gold nugget worth \$14, picked up on the gravel claim of L. Ludekens, near Aqueduct. They are ground-slucing the upper portion of the claim. The lower part is believed to be far the richer, but this cannot be worked until the Grass Valley hydraulic claim is worked out.

SUTTER CREEK.—*Cor. Ledger*, Dec. 9: Retimbering the Hector shaft is finished. They were considerably surprised to find the water standing in the shaft at the 80-foot level, showing conclusively that the pumping in the Wildman did not affect it in the least. Taking out the water has been deferred for some reason, but it is to be hoped not for long. The mill is running on surface ore yet, and they may have enough to keep the stamps in motion through the winter. Sinking at the Wildman is progressing very favorably. The fifth set of timbers is in, which takes them 60 feet. In about two weeks the 100 feet will be finished, when cutting in the foot-wall will be next in order, where they expect a ledge of good paying ore. The mill, which has been hung up for a short time, will in all probability be started up some time next week. At the Belmont, the new pipe referred to two weeks ago is made and laid in place, and the mill, as soon as it undergoes the necessary repairs, will be started. The hoist and buildings over the old Boss shaft are finished, and cleaning out and sinking in a few days will be in order. The Lincoln is still running in the usual way. The cleanup last week was the best yet made, enabling them to pay up in a creditable manner. Sinking at the South Eureka is progressing in a very satisfactory way, and everything is looking very encouraging.

Butte.

A RICH MINE.—*Oroville Register*, Dec. 10: A Paradise gentleman who was in the *Register* office lately, told us that a few days ago Col. McLaughlin and Sir Kirkpatrick visited the Magalia Consolidated mine. The gravel was cleared up and the sluices entirely free so as to make a fair test of what the gravel was yielding. The miners dug from the face of the tunnel seven carloads of gravel, which was then washed under the inspection of the two gentlemen we have named. When the earth was washed off and the riffles examined, they were found filled with gold, the pieces varying from ten cents to \$15 or \$20 in weight. As specimen after specimen was picked up and handed to the genial Colonel and his companion, a smile spread over their faces and they were very much pleased with the result of the cleanup, which amounted to a little over \$300 per car, or about \$800 for the seven carloads.

THE JONES MINE.—*Oroville Mercury*, Dec. 11: There is a bright and promising future for the Jones claim, situated at the head of Kimsbush creek. In the early summer the owners, J. R. Jones and sons and D. Reise, ran a tunnel 300 feet and found they were too high for good drainage, they ran another, and at a distance of 80 feet found good paying gravel. At this point the channel is 40 feet in width, with every indication of reaching double this width. The depth of the gravel is from three to four feet, and pays \$2 and \$3 per car.

Calaveras.

NEW SUPERINTENDENT.—*Chronicle*, Dec. 12: The superintendency of the Quaker Mine, near the Junction, is now under M. W. Beardsley, vice Thomas Goodwin, resigned. Operations have been suspended for several days past, Superintendent Beardsley having gone to the city to make new arrangements. The shaft is down 500 feet, 400 feet of which is a vertical shaft in solid rock, while the last 100 feet is an incline following the vein. A heavy flow of water was encountered at 500 feet, doing irreparable damage to the incline. We understand that the matter under consideration is the continuation of the vertical part of the shaft, which is unimpaired, in the solid rock.

FROM ANGELS.—Both furnaces at the chlorine works are in operation roasting sulphurets. The mines in operation in this vicinity are all running full handed and yielding much gold.

El Dorado.

BLAIR'S DISTRICT.—*Mt. Democrat*, Dec. 12: At the Blair mine, they have struck gravel, but the freezing of the ditch has stopped work in the tunnel for the present, and the whole force of men is engaged on the outside in carpentering and grading. Most of the machinery for a steam air compressor was hauled to the mine this week, in spite of the bad roads.

KELSEY.—*Mt. Democrat*, Dec. 12: We have the best authority for stating that work on a very extended scale is contemplated by the American River Syndicate. The perfect success of the running of the St. Lawrence mine by power electrically transmitted from the syndicate's power station at Rock creek, over a distance of five and one-eighth miles, the longest transmission for power purposes yet attempted in the United States, has demonstrated the value of such application of power to mining purposes. We believe that Mr. Cullen Pearson will now undertake and transmit power successfully over a distance of thirty miles. Mr. Pearson has left for England in compliance with a called request from the Syndicate Board of Directors, in order that he may give his views on certain points connected with the proposed enterprise. He is accompanied by his acting superintendent, Mr. W. H. Hushand. During their absence the Dalmatia mill will be closed down, the work at that mine being concentrated on the drain tunnel, and in preparing the ground for the erection of electrical hoisting and pumping gear,

as it is proposed to sink at once 500 feet, the results obtained from the surface working having been so satisfactory. Work is also being strenuously pushed ahead by the syndicate on the construction of the American River ditch. The St. Lawrence continues to run uninterrupted, and we would counsel all those interested in mining properties to go there and see the beauty and simplicity of the electrical machinery by which the entire operations of the mill are controlled. There are rumors to the effect that a most important combination of mining interests is in contemplation.

Humboldt.

PRESTON MINE SUBMERGED.—*Blue Lake Advocate*, Dec. 12: The Preston coal mine on Maple creek has been forced to suspend operations by the rise of water in that stream. It is possible that it may remain shut down until spring, though it is not clear that it has been definitely decided to wait so long. One thing is plain, that very little more can be done with the machinery heretofore employed at the shaft. A flume has been built down the creek and a water wheel placed in the creek to pump water from the mine. But the rise of the creek made it necessary to remove both flume and wheel to prevent them from being washed away. Even the mine, which is situated on the bank of the stream, has been submerged and the shaft itself is full of water. It is learned here that there is talk of ordering machinery and prosecuting operations all winter. It would be unfortunate for a mine from which so much is expected to remain closed down all next spring.

FROM HAWKINS BAR.—James McDonald reached Blue Lake Wednesday from Hawkins Bar, where the Horseshoe Bend Mining Co., of which Mr. McDonald is a member, are operating. A road from Hawkins Bar two miles to the mine has been built since September, and the company is digging a ditch to Davis Point which will be 2½ miles long. Upon completion of this work, a mill will be put up and the quality of the gravel exploited. It is expected that work on the tunnel at Horseshoe Bend, which is to be 450 feet long, will begin in the spring, but it may be deferred if the gravel at the Point pays well.

Mendocino.

QUARTZ LAND LOCATED NEAR HOPLAND.—*Ukiah Press*, Dec. 11: Hopland is now on the eve of a mining boom, and arrangements have already been made to sink a shaft. About six years ago a few business men of Hopland began mining about two miles east of the town and took out \$1200 in a short time. The tailings, however, were run on the land of Henry Willard, and he objected to the work proceeding. The matter was therefore dropped until recently. Several San Francisco capitalists, who are much interested in mines in other portions of the State, sent an expert there a couple of weeks ago. He found a quartz lead which he pronounced very rich. The four San Francisco capitalists and W. W. Thatcher of Hopland accordingly formed themselves into a company and made an agreement with S. Forester, who owns 103 acres of land where the quartz is supposed to be, whereby the former have the privilege of sinking a shaft and doing other preliminary work. If pay dirt is found, Mr. Forester is to be given a one-sixth interest in the company for \$10,000. Arrangements have been made with a Ukiah well-borer to sink a four-foot shaft 72 feet. The gentlemen interested are all men of means and experience, and they are confident that the prospecting will be decidedly satisfactory.

Nevada.

GOLD DUST.—*Nevada Transcript*, Dec. 9: Some Chinamen drifting a gravel claim adjoining the old Sargent & Jacobs hydraulic mine of Quaker Hill are getting big returns for their labor. They recently sent to San Francisco a bar worth \$7500. The bond which Fritz Meister had on the Canyon Creek quartz claim in Washington district recently expired, and the owner, Geo. G. Allan of this city, gave an extension of time. Mr. Meister, who recently returned from a trip to Salt Lake City, made the preliminary arrangements during his visit toward interesting some Utah capitalists in the property, and it is likely they will organize a company for its development. The Canyon Creek has the making of a big mine. It is located in a region famous for its big, rich and permanent deposits of gold ore. Night before last there were shown at this city some remarkably fine specimens of free gold and black sulphurets ore from a Washington district ledge located by Nickerson & Son. The Delhi, above Columbia Hill, from which property come frequent authentic accounts of rich strikes, is keeping up its record. A pound of ore taken out last week was reduced in a mortar, and gave \$40 worth of gold.

ACTIVE.—*Nevada Transcript*, Dec. 11: The business of gold mining at this city has not for many years been so active and attended with such profitable results as is the case at present. It is estimated that there are upwards of two hundred more men working here than there were eighteen months ago. The improvement in the mining industry has been gradual and founded on merit. Many new claims are being developed with encouraging results, and a number of the old ones are giving better returns than they have for a long time.

THE KNICKERBOCKER.—At the Knickerbocker drift mine, just west of town, there has been opened up within the past year a body of high grade gravel five hundred feet long and ranging in width from one hundred to two hundred feet. The deposit is increasing in width as it is followed. The dirt pays about fifteen dollars a day to the drifter. The owners have already got back the money expended in prospecting and will shortly begin to realize dividends. This claim, like most of the others around Nevada City, is not for sale.

THE HARMONY.—The Harmony Drift Mining Company has decided to purchase from George G. Allan the ten-stamp mill required for crushing the quartz gravel found in the channel, and will shortly have the stamps dropping. Nuggets of varying size, some containing as high as two dollars worth of gold, are frequently found, and by the washing process alone these go upon the dump intact. The mine has for some time not only paid its current expenses, but paid for expensive improvements such as putting in water and pumping machinery, besides furnishing a surplus which is applied to the reduction of the debt incurred in starting up.

THE GOLD FLAT.—The company that recently commenced reopening the old Bruce B. Lee shaft on Gold Flat will by the end of this week have the

retimbering and enlarging finished to a depth of one hundred and sixty feet, below which point the formation is such that no timbers are required.

PIONEER REDUCTION WORKS.—Fred W. Bost is having a new furnace and tubs put into the Pioneer Reduction Works, which have been idle for six months past, and will be ready within two weeks to work sulphurets by the chlorination process.

THE CHAMPION.—The Champion Co., which has well equipped chlorination works for the reduction of sulphurets from its own mine, proposes to soon resume operations in that department. The mine is doing better than ever before.

THE PROVIDENCE.—The new company engaged in reopening the Providence mine, which has for years held a place as one of the highest and richest gold mines in the State, is crowding the work of preparation to the utmost. The overhauling and replacing of machinery, setting of pump columns, etc., is nearly completed, and within the next ten days everything but the mill will be running in full blast. The shaft is to be continued downward from its present depth of twelve hundred and fifty feet. A crosscut is to be started westerly from the twelve hundred and fifty level to tap the back ledge which the old company worked from the six hundred level. It is expected the new crosscut will catch the ore vein within a distance of about five hundred feet from the shaft.

Plumas.

DRURY AND PACIFIC.—*Plumas Bulletin*, Dec. 10: The cluster of mines commonly known as the Drury and Pacific mines, situated at the head of North canyon, near Greenville, have developed into a very important and profitable business enterprise. About two years ago, Messrs. Standart and McGill bonded the first named property from J. R. Drury, and began development work and the extraction and milling of ore. From the profits thus obtained, they purchased the Drury mine about a year ago. With it were then combined the Pacific, the Forest King and the Kettle quartz mill, controlled by Mr. Standart. It was then that the new owners began a systematic development of the property by driving tunnels into the mountain, on the veins in the Drury mine and in the direction of the other properties lying to the northwest. It certainly looks as if this mining property would develop into one of the most extensive and important in this part of the State. Its success argues a great deal in behalf of the quartz interests in that part of Plumas. With a mill situated at the favorable point intended for its location, the ore can be extracted and delivered into the mill at a very small cost.

SINKING COMPLETED.—On Monday evening, the last sound of holes was fired in the bottom of the shaft of the Crescent mine, marking the completion of the "sump" at the new 400-foot level. Drifting will at once begin, and the extraction of ore and starting of the mill to crushing is expected soon to follow. The former workings in this great mine, which have extended over a period of 35 years, and yielded immense sums, have all been above the 200-foot level. This fact being taken into consideration, the importance attached to the opening up of this second level becomes apparent, and marks a new era in the history of the property. Mr. A. G. Swan came up from Granite Basin last Friday, and he reports good results from the milling of ore from his mine there. With his five-stamp mill, he crushed 26 tons of ore, and secured 38 ounces of gold, worth \$77 per ounce. Two men extracted the ore, fitted up the mill and did the crushing, all in two months. Mr. Gould is mining on Mt. Creek, about three miles from Quincy. He is engaged in drifting, and has good prospects. Next spring he will open up a large stretch of channel. Jo. Peppin of Granite Basin will fix up his tramway, and run ore direct from the mine into the mill. He has a two-foot vein of good ore.

CRESCENT MILLS.—*Plumas National*, Dec. 5: Crescent Mills has an active appearance, and with the present outlook, it bids fair to be the liveliest town in Plumas. The Green Mountain mine is running 30 stamps on rock hauled from Bachelors' old dump of 30 years ago. This rock pays well. The Crescent Milling Co. are pushing their prospects, and Mr. Whitney expects soon to have the mine in fine working shape.

HUNDRED DOLLARS A TON.—*Oroville Register*, Dec. 13: Joseph Willett of Brown's Hill, just over the line into Plumas county, was in Oroville yesterday. He tells us that he is running a tunnel on his quartz ledge, and that the rock looks exceedingly well. The lode is four feet wide and the whole ledge prospects well. It is not a chimney or pocket ledge, but the rock is very rich and he thinks much of it will go as high as \$100 a ton. Mr. Willett has a good gravel mine, but owing to the high altitude he can only work it a short period when water is plentiful from the melting snows.

San Bernardino.

GYPSUM.—*San Diegoan*, Dec. 8: The 200 tons of gypsum piled up on the Santa Fe wharf, awaiting shipment to San Francisco, demonstrates two facts—one, that the vast mineral resources of this and other Southern California counties are being brought to the notice of the commercial world; the other, that San Diego harbor is the only outlet by sea through which any shipment of any kind can safely be made. The 200 tons of gypsum now awaiting shipment is not the first which has passed through this port for the north. For some time past the Ventura Crystal Plaster Co. has been sending on an average of two cars per day to this city from their mines at Rincon, near South Riverside. This company owns large deposits of this mineral near Riverside, and is reaping a good profit from its sale. Throughout San Diego county there are deposits of gypsum equal to any in other parts of the State, and await an enterprising individual or company to work them.

San Benito County.

OIL WELLS.—*Hollister Advance*, Dec. 11: Mr. A. W. Drumgold has struck a bonanza in an oil well in the Vallecitos valley, forty miles south of Hollister. The name of the well is San Carlos No. One. The well is eight inch bore, 106 feet deep, and 900 gallons of oil are pumped from the well every eight hours. The well is located on Sec. 8, T. 17 S., and in the opinion of experts the whole region abounds in oil. Mr. Drumgold is now in the city making arrangements for the sale of oil to dealers, and also for the purchase of 1½ miles of pipe to pipe the oil from the well to the county road. An analysis of the oil shows it to contain 77 per cent. of kerosene, which is a first-class showing.

San Diego.

HELVETIA.—*Julian Sentinel*, Dec. 10: The Helvetia force has succeeded in reaching the goal of their desires, the old works. These were cut into Friday night and the shift was laid off to allow the foul air to be cleansed away. Upon entering the old works, the quality and quantity of ore in sight was found to exceed the expectations of those interested. This is now a great property with the big pay shoot, encountered in their search for the old works, and the body of ore found to exist in the old works. This mine now takes front rank in the many good properties in the Julian mining district. The question for the Helvetia people now to solve is how and where to get more water. The present supply of water is only sufficient to run five stamps eight hours a day, while there is ore enough coming up the shaft to keep ten stamps busy every moment. At no time in the past has the prospect of a paying future for the Cincinnati Belle been so good as now. The shaft that the Murphy Bros. contracted to sink from the lower level has been progressing rapidly, and recently opened up a rich vein. The gold-bearing part is nearly three feet in width, and it is estimated will run as well, if not better, than any ore heretofore taken from the mine. The Ruby M. and Co., in addition to the men employed at the Ruby, has placed a force at work on the Wilcox mine. Charley Barnett has been having 15 tons of the Hidden Treasure rock run through the mill.

San Luis Obispo.

SANTA ROSA PETROLEUM CO.—*San Miguel Messenger*, Dec. 13: A company under the above title has organized and will commence prospecting for oil at an early date on Santa Rosa creek, in the region south of Cambria, in this county. This company has leased several thousand acres of land for a term of years and proposes to commence operations at once. A gentleman who has had years of experience in boring for oil in the East, informed us yesterday that the surface indications are the best he ever saw anywhere. The company has secured the services of A. C. Massey, and he will take his drilling machine over at once. We hope to be able to report interesting developments before long.

Santa Clara.

NEW ALMADEN MINE.—*Cor. San Jose Mercury*, Dec. 9: There is no good in disguising the fact that the halcyon days of New Almaden are over, for trouble we have in the most palpable form—palmy days are of the past, and, alas for many, misery ahead. Men that have labored here for 30 years, and their children that were born here, have now to leave and are leaving by the score. They are totally ignorant of the ways of the world and have to seek new fields for labor, but the manager of the mine has done all possible for the well-being of those that are obliged to leave. Money, food and raiment has been liberally bestowed so as to give all a start outside of Almaden. Such generosity is unprecedented. Kindness of heart figures in the matter, for gifts by the company may be considered generous; but the personal gifts of the manager, J. B. Kandel, were most generous. My readers will hardly realize the number of indigent, lame, halt and sick of a mining camp of 1500 people. I assure you there were many, and to suitably clothe and put coin in the pockets of these, many took a large sum of money—more than you dream of—and yet it was done. Everything must have an end—even the great New Almaden quicksilver mines. The end has almost been reached, and yet there are many here who hope for some new discovery that may give new life to the mines. The exodus has caused a severe damper on the spirit of the camp, from which it can hardly recover. All this is caused by the poor quality of the ore mined and the absolute necessity of reducing expenses to keep the mine afloat.

Shasta.

TEXAS CONS.—*Shasta Democrat*, Dec. 9: There is some probability of another big mining deal being consummated between now and the 1st of January. An option covering that time was given to San Francisco parties, some days ago on the Texas Consolidated of Old Diggings for \$340,000. The Iron Mountain mine and mill will be closed down next week for the winter. During the winter some repairing will be done on the reduction plant. Jim Salla was in town Monday and remarked that his company contemplates moving this plant to the river, and in fact, a route for a road from the mine to the proposed new mill site has been surveyed, and the route found to be practicable and on an easy grade. The mill site on the river was secured some months ago.

Siskiyou.

STRINGER OF QUARTZ.—*Yreka Journal*, Dec. 9: Arthur Scheld and Clarence Davis of this place struck a very rich stringer of quartz last Thursday, at the head of the North Fork of Greenhorn, almost at the top of the divide, near head of Humburg creek, running down on opposite side. Next morning the claim was covered by about 16 inches of snow, with probability of considerable more snow right along in that elevated locality, which may prevent further work until spring.

WATER.—The recent snowstorm will prove highly beneficial to our mining industry, by supplying an abundance of water for hydraulic, placer and quartz mining, as soon as the weather moderates or warm rains occur. Besides filling the ditches and small streams with water for ground-slucing, a good head of water will be obtainable in running all the quartz-mills to the utmost capacity in crushing quartz on hand.

RIVER MINERS.—The river miners on the Klamath still continue operations as usual, the cool weather lately having lowered the stream, though the heavy rainstorm of Monday night on top of the deep snowfall of last Thursday, may cause a sudden freshet to shut off river mining by flooding the dams.

Tulare.

MINING OPERATIONS AT MINERAL KING.—*Visalia Delta*, Dec. 10: Wm. O. Clough of Mineral King was in town this week, accompanied by Misses Ada Glenn and Hilda Clough. In speaking about the mining operations, he said to a *Delta* representative: "Considerable assessment work has been done this year at Mineral King, and higher grade and finer grained ore has been found in the following mines: Lady Emma, Empire Discovery, second extension, Young America, and a mine that belongs to John Edwards. I have sunk a shaft 65 feet on the Pinnacle and drifted eight feet, and have struck antimony and a little free gold. The ledge has been

struck to the lower Empire tunnel, and indications are good for a big mine. The ore is well filled with mineral, and is supposed to be rich in silver, and contains iron. The tunnel is about 600 feet deep. The Lady Emma is a fissure vein, and runs east and west, then widens as we sink. There are two veins, 100 feet apart, and are supposed to come together at a depth of a few hundred feet which make an immense body of ore. The capping is iron, and is about 20 feet wide. Fine galena is found in this claim, and is supposed to be the mother lode of the district. An effort should be made to sell or bond these mines to parties that have enough capital to work them, for they are all fine prospects.

Tuolumne.

TUNNEL.—Tuolumne Independent, Dec. 12: The tunnel of the Connelly mine, near the Deadhorse, is now in 100 feet. The ore found in the shaft went \$35 per ton. The Experimental mine near Columbia, owned by the Engelke Co., has been bonded Mr. Whorf. Ten men were put to work Tuesday. The old Shanghai mine on Yankee Hill, which has produced considerable wealth in years past, is to be re-opened. It is said that E. C. Loftus will be the manager. Ore is now being hauled from the Carlotta mine at Cherokee to the Platt & Gilson mill at Soulsville. This mine has produced very largely in the past. The ore goes about \$100 per ton. The Deadhorse mine, now known as the Eureka Consolidated, has been idle for a month past, on account of scarcity of water. The mill has also been idle. Work was resumed one day this week. The Engelke silver mine at Silver Mine Gulch, American Camp, is very rich. There are now between 175 and 200 tons on the dump, picked specimens from which went \$600 in silver and \$200 in gold. The tunnel at the Oakland mine, Yankee Hill, is now in 670 feet, and within 150 feet of the chute. The ore is low grade, but can be profitably handled. The chute will be reached within about three months, when the mill will be again put in operation. L. B. Hargrave, James Boyd and L. S. Hargrave have opened a mine on the Tuolumne river, opposite Moffitt's bridge. The vein is on the mother lode, 60 feet wide, and assays \$9 per ton. The owners claim that they can work their ore for 50 cents per ton. About 50 tons of ore are now on the dump. The company expects to put in a 60-stamp mill, and a concentrator. The Redding & Lyoch mine, on the Tuolumne, near the Buchanan, has been worked very quietly. Recently the statement has been given out that the vein is five feet in width at the surface and averages seven feet to the 350-foot level. The rock goes from \$14 to \$30 per ton. The Badger mine was bonded on Dec. 12, 1890, for \$8000, by A. B. Tryon, J. M. Palmer, S. J. Mayock and A. L. Ellis. George Stayton was put in as superintendent, and at once began to develop the mine. The prospect was satisfactory, and on Friday of last week the money was paid and the title passed. Work will now be prosecuted more vigorously. Mr. Stayton will continue as superintendent.

NEVADA.

Columbia District.

CANDELARIA.—Walker Lake Bulletin, Dec. 9: Reports from Candelaria are to the effect that there is no likelihood of an agreement between the men and managers. Nearly 100 men have left Candelaria since the 1st, in search of employment elsewhere. The company boarding houses have shut up, and the outlook is rather gloomy for the winter.

Go.umbus District.

CLOSED DOWN.—Cor. Virginia Enterprise, Dec. 13: Our little town has lately experienced one of those changes that mining towns generally are subject to. Both the Holmes and the Mount Diablo mines and mills were closed down on account of a disagreement between the employers and the employees about wages, which were, up to the time of the shut-down, \$3.50 per day. The miners refused to accept a reduction therefrom of 50 cents per day, which the companies thought necessary on account of the low price of silver. A few men were retained after the 1st, and are being paid full wages for their time of cleaning up preparatory to the final closing. The discharged men thought of leaving the place after the mines closed. A good many have gone to Tule district.

Oneota District.

FURNACE CANYON.—Walker Lake Bulletin, Dec. 9: Last week a Bulletin reporter visited the mines in Furnace or Hutch's canyon. The mines are in Oneota district, Esmeralda county, about 18 miles northeast of Benton, which is unquestionably one of the most inviting fields for the prospector in the State. As a general thing, the ledges are small, but not unfrequently they widen to several feet. The ore is blue bromide and black ore, and is all of high grade, running from 100 to 2000 ounces to the ton. At the present time there are but 23 miners working in the canyon on four or five claims. In this canyon is located the famous Indian Queen mine. Many years ago an Indian found a rich piece of float rock and took Wm. Witherell to the place where he found it. Witherell followed it up and soon unearthed a ledge from which upward of three millions of dollars were taken. Adjoining the Queen is the Poorman. It is, perhaps, the most valuable claim in the district at present. Wm. Witherell, Fred Buecher and Robt. Somerville are the owners of the Poorman. After running a tunnel several hundred feet, they are into a ledge of rich ore, but the Indian Queen Co. placed an injunction on them prohibiting them from extracting the ore. The case is now being tried before Judge Rising. About quarter of a mile west of the Poorman is the Diana, owned by Bobby Roberts and Dickey Morgan. A shipment made, a short time since paid up all old debts and laid in a big supply of grub, tools, etc., and there is now a carload being worked at the Soda mill, which will give the boys a snug bank account. Pat Gilfoyle has been in the canyon for many years. He has five locations, and keeps pegging away faithfully. Adjoining the Diana on the west is the Railroad claim, owned by John Smith. Mr. Smith has done considerable work on his claim but at intervals he has been obliged to quit work on the mine in order to earn money by day's pay to keep himself in supplies. He left last Wednesday for the canyon with grub enough to run him all winter. He has already got the ledge in his tunnel. Next to the Poorman, the best mine in the district is believed to be the Isabel, owned by Henry Garner and Louis Williams. They have a 10-inch vein of ore that mills from 200 to 500 ounces, and

our reporter was told that they can easily extract \$100 a day for each man now employed. The old Coalburner mine is being worked by Tommy Rath. A stream of pure mountain water flows through the canyon and the hills are covered with pine and mahogany timber. Water costs nothing and wood is piled at the cabin door for \$3 per cord. Altogether this district bids fair to be a busy place next spring.

Oceola District.

A MAMMOTH NUGGET.—Grass Valley Telegraph, Dec. 9: One of the largest nuggets yet found in any hydraulic mine on the Pacific Coast was discovered on Sunday morning, November 29th, in the placer claim at Oceola, Nevada, of which J. H. Marriott, formerly of North Bloomfield in this county, is the superintendent, remarks the Nevada City Transcript. It laid on a high point of a big rock, and was covered with only one foot of natural gravel. Its maximum thickness on one edge is 1 1/2 inches; on the opposite side 2 1/2 inches. On the flat side its greatest width is 4 1/2 inches and its greatest length 7 3/4 inches. Its weight in the air is 146.1 ounces Troy, its cubic contents 41.1 inches, and its estimated coin value \$2200. A letter from the mine says they have completed their season's work, everything being frozen up. During the past season the claim has yielded a number of nuggets ranging in value from \$10 to \$500, but the one washed out on the 29th ult. caps the climax.

Taylor District.

ARGUS.—Pioche Record, Dec. 5: News comes from Taylor, Nevada, that eastern capitalists, through the mediumship of A. C. Cleveland, are negotiating for the purchase of the Argus works and group of mines. Through the instrumentality of Mr. Cleveland, an option has been taken until the 15th of January and "Jack" Wheatly placed in charge of the property until the expiration of that time. It is to be hoped in behalf of the town of Taylor that the proposed purchasers will get the property. The past history of that mill is that when running it was conducted in a very loose and unsatisfactory manner. It is believed that the property properly handled is a good paying proposition.

Tule District.

A REGION OF RICH LEDGES.—Cor. Virginia Enterprise, Dec. 13: News has been coming to Candelaria about strikes made in Tule by men who had been prospecting in that part of the county. Jack Manie had struck a large body of rich silver ore there very near the surface. Jerome Vidovich had some of the ore milled at the Candelaria Company's mill, and received over \$1000 as a net result for 33 days' work at Tule. His first-class ore yielded 796 ounces and his second-class ore 300 ounces of silver per ton. Others also struck rich silver ore, and as proofs were arriving here in the shape of shipments of ore, most of which was milled here with excellent results, the discharged men began a move on Tule. While this was going on, one of our townsmen, Milo T. Plamenaz, arrived with the good news that he had struck a body of rich ore in the main shaft of the St. Louis mine at a depth of 114 feet. To understand the importance of this strike, one must also know that the St. Louis mine is the oldest located claim on the ledge of the same name. This ledge is easily traced on the surface a distance of over 5000 feet, and the whole length of it is located by different individuals and companies, all of whom are taking out rich ore from near the surface. Among these is Dave Wogan, who is taking out very rich ore at the north end. Dick McNaughton and Charlie Snapp got out a shipment of ore that milled at the Mount Diablo mill at Soda-ville 642 ounces per ton. Next, in a southerly direction, is Bob Robinson's location, at present leased to Adolph Longabaugh, who is also taking out rich ore. Next southerly lies the Good Hope, owned by the Plamenaz Company, which also owns the St. Louis mine, the most important one on the ledge. Still farther south is the South Extension, owned by Spratt & Tracy, leased to Hill and Nidovich, whose shipment of first-grade ore milled 796, and second-grade about 300 ounces, as already stated. Next southerly is Jerome Ferrier's claim, whose rich strike was heralded by Charley Akin and created a great deal of excitement all over that region, resounding clear to Candelaria. Jack Manie's ore shipment, which is expected to arrive here within a few days, assays in the thousands. All these mines are being opened up with but small outlays of labor or other expense, the ore appearing near the surface. This fact left it an open question as to what extent it went downward until Milo T. Plamenaz solved the problem by striking a still richer deposit at 114 feet. Many of our unemployed miners are preparing for a trip to that part of the county, and it is confidently believed that ere spring shows any signs our men, one and all, will be the owners of rich mines in Tule.

Wahoe District.

CON. CAL. & VIRGINIA.—Virginia Enterprise, Dec. 13: 1100 level: The west crosscut, No. 1, started from the south drift at a point 100 feet south from the shaft station, has been extended 48 feet; total length, 473, the first 136 feet being in vein matter and the last 12 feet being in quartz of low assay value. Have continued to prospect the ground between the east crosscuts Nos. 4 and 5, and saved therefrom a few tons of milling ore. From the south drift at a point 40 feet south from east crosscut No. 4, a southeast drift was started and advanced 40 feet in porphyry and quartz, carrying a low assay value. 1650: Have continued to extract ore of fair quality from the drift run west from the top of the upraise carried up 50 feet above the south-west drift. Ore of fair quality has been extracted from the drift run east from winze No. 3, 73 feet down, in working upward from that point, 1750 level: In working out and upward from the bottom of winze No. 2, sunk from the 1650 level, we continue to extract ore of fair quality. Have also extracted some milling ore at the point where the upraise carried up from the crosscut run west from the southwest drift made connection with the stopes on the eighth floor. Have continued to extract ore of average quality at the point where the upraise from the southwest drift, 70 feet north from the south line of the California ground, connected with the eighth-floor stopes. The east crosscut No. 2, 84 feet south from the east crosscut No. 1, has been extended 28 feet; total length, 45 feet; continuing to show some low-grade ore. At a point 55 feet south from east crosscut No. 2, an east crosscut, No. 3, has been advanced 12 feet in the old stope and fillings of paying value have been extracted therefrom. The

station on the northwest drift has been completed, and an engine put in place, and the winze No. 2 has been sunk eight feet in porphyry and quartz. 1800 level: Are making some repairs by grading and timbering to the drift run north from the bottom of winze No. 1, sunk from the 1750 level. There has been extracted from all parts of the mine during the week 819 1300-2000 tons of ore, of which 437 350-2000 tons was shipped to the Morgan mill, and 382 950-2000 tons to the Eureka mill. The average assay value of all the ore worked at these two mills during the week was 1110 tons at \$24 per ton. Bullion shipped to Carson, assay value, \$14,202.83.

OPHIR.—1465 level: Have continued our prospecting work in the openings leading from the point where the upraise from the sill floor of this level connected with the drift run west from the winze 122 feet below the sill floor of the 1300 level, and have extracted therefrom and raised to the surface during the week 45 tons of ore, the average assay value of which is \$22.50 per ton. 1550: The shaft men have resumed work in making necessary repairs in and about the shaft.

MEXICAN.—On the 1465 level the winze started at the end of the crosscut run west from the north lateral drift at a point near the south boundary line of the mine, 132 feet in, has been sunk 11 feet, total depth, 70 feet; in porphyry carrying lines of quartz, showing little value.

UNION CON.—On the 900 level the joint Sierra Nevada and Union Con., west drift from the shaft, has been extended during the week 34 feet; total distance west of the shaft, 1494 feet; the last six feet being in porphyry.

GOULD & CURRY.—200 level: All work in south drift, 45 feet from the top of the upraise, has been discontinued for the present. At a point in east crosscut No. 1, 85 feet from top of upraise No. 1 from 300 level, started a southeast drift No. 2, on a small stringer of quartz that shows some value, and extended some 15 feet. Main north drift, 65 feet above 200 level, has been extended 25 feet through porphyry, clay and quartz; total length, 110 feet.

BEST & BELCHER.—1000 level: Upraise No. 1, has been carried up a distance of 16 feet through soft porphyry and seams of clay and quartz; total height, 80 feet.

ARIZONA.

THE COPPER CAMP.—Prescott Courier, Dec. 11: Geo. H. Curry, who recently returned from the great copper camp at Jerome, thinks there will be a town of at least 2500 workers there by spring; says the roads are getting rather slippery for teams, and great efforts are being made to complete the tramway before the winter snows set in. It is claimed the tramway will be completed within 30 days, when five more stacks will be added to the smelters. The roasting heaps extend from the smelters one mile and a half in length. Five men knock down sufficient ore in the mines to keep the whole works running at present; balance of force of miners are kept busy doing development work.

EUREKA.—Paul Dillon, one of the owners of the Parnell mine and mill, Eureka district, came in yesterday from that mine, and states that the mill had been entirely completed the day he left, and would be started in a day or two afterward, the finishing of a trestle from the lower tunnel to the mill requiring that time. Several hundred tons of ore are on the dumps, and thousands of tons more ready to be stoped out. The mill will be kept going steadily.

DAKOTA.

MICA.—Deadwood Pioneer, Dec. 8: We are reliably informed that the "mica" interests of the Southern Hills are again attracting attention and that active operations will soon be resumed on properties that for some time have not been making an output. There can be no question but that the mica mines of the Black Hills will pay well for the working, as the production is of a grade that is in general use and can be cheaply mined and marketed.

LOWER CALIFORNIA.

SILVER MINES ON THE GULF.—Lower California Dec. 5: Skipper Grosse was at the San Juan silver mines on top of San Juao mountain, near the gulf, two or three weeks ago. He found the mines and works in a flourishing condition, and the owners, the Cranz brothers, expecting to put on a much larger force of men. The skipper was surprised to be able to speak by telephone to his friends at Las Flores, 12 miles distant on Los Angeles bay where the mill is located, and to which point all the ore is packed by mules down a very heavy grade. The enterprising Cranz brothers are going to do away with this mule-killing work, and construct a tramway down the mountain at considerable expense. Surveys are now being made for this work. Four miles from the Cranz mines is the Florida silver mine, which will be worked as soon as the mining deputation goes down from Ensenada to give possession, that district being now under the jurisdiction of the authorities at this place. Another silver ledge has been discovered at Santa Ana, midway between the Pacific and the gulf, and is being developed, with good prospects of showing permanency. Discoveries of mines are becoming common in that section.

ALAMO.—A depth of 173 feet has been reached in the Princess mine at Alamo, but the drill is still in granite. A small pay streak was encountered a few days ago, but it did not last long. Crosscutting is still continued in the 100-foot level. The Aurora is a few feet deeper than the Princess, and doing well. The Manzanita mill is doing a little custom work. The El Paso mill is not running at present.

NEW MEXICO.

GOLD.—Southwest Sentinel, Dec. 11: The Pacific Gold Co.'s mill at this city run steadily last month, crushing about 1050 tons of ore from the Pacific mine. Nearly all the gold bullion shipment last month was from this mill. The Steele Rock Mining Co. is pushing work upon its Jim Crow mine, which is looking more favorable than ever. The Anson S. mining company's smelter at Hanover will blow in to-morrow. With 300 tons of ore on the dumps and a full force working in the mine, heavy shipments of copper matte will soon be

made. H. J. Hutchison of Central has booded his one-half interest in the Jim Fair group of iron and copper mines at Hanover to John Brockman for \$5000, a cash forfeit being paid. The Grant County M. and M. Co.'s lease on the Uncle Sam mine, at Cow Springs is a bonanza. Ten men are working at the mine. A thousand-dollar brick was molded at the Bremen mill from the ore on Saturday last. O. Bulow is in from Bald mountain and reports encouraging prospects on his Big Blossom mine. The vein is a very large one, being 14 feet in width, generally low-grade, but on the hanging-wall there is a four-inch streak of \$1000 ore, from which a two-ton shipment will be made in a few days. The bullion shipments from Silver City during the month of November aggregated \$24,925.

OREGON.

ANOTHER WHITE SWAN YIELD.—Bedrock Democrat, Dec. 7: Another output of the White Swan mine was brought in to the city yesterday and deposited at the Baker City National Bank by Mr. William Mulkey, one of the owners. The amount was sixty-eight and one-half ounces, or about \$300. Mr. Mulkey, when seen by the reporter, was in his usual good spirits, and observed that the White Swan was far from petering out, as he termed it. He said that timbering had been commenced in the mine, and the ledge at this time showed a width of fifteen feet, one wall having not yet been found.

CORNUCOPIA DISTRICT.—Bedrock Democrat, Dec. 7: Messrs. Carey and Pierce gave the following account of the operations on the various properties in that district during the past summer: The Oregon Gold M. Co. has put in a chlorinating plant and is working it to its fullest capacity. The concentrates are being successfully treated, saving 93 per cent. There are 400 tons of concentrates in the mill, and it is the intention of the management to increase the capacity of the plant in the spring. The Davis mill, which has been doing good work, is closed down for the present on account of a landslide. This mill is a Huotington plant of 10-ton capacity. The Hope mill, a five-stamp plant with two concentrators, has also closed down for the present. Fred Steen has a Huntington plant on his property, which he will put up in the spring. Mr. Steen has constructed over three miles of road from his property to Cornucopia, at an expense of \$2000. For several seasons past he has been working his ore by the arrastre process, but now that he has a mill, increased outputs may be looked for. John Carey has run in 100 feet on his Last Chance property, and from a six-inch vein has developed a six-foot vein. Mr. Beers has further developed the Parson mine by an additional 150 feet, and a large and well-defined ledge is exposed. The Union, the property of Ainsied & Co., has been worked all summer, and operations will be continued all winter. The company has worked a large amount of ore at the Hope mill, and a carload was shipped to Tacoma. The most satisfactory results were obtained. They will put in a milling plant next season. Carey and Pierce have developed a fine property in the Red Maiden, and a fine three-foot vein is in sight. They expect to go down on the property in the spring. This mine is situated just below the celebrated Simmons group. There will be at least three mills in operation in this district by the first of July.

NOTES.—Jacksonville Times, Dec. 11: Piping has commenced at Ennis & Cameron's mines in Galice creek district. The Sterling Mining Co. has an abundance of water and is taking advantage of it. Messrs. Bailey, who now own the Orme diggings in Foothills creek district, have commenced operations for the season. A. W. Sturgis is cleaning up the balance of the ground he stripped off last season. He has one of the best pieces of mining property in Oregon. J. T. Breeden and Mr. Anderson have struck very rich ore in their quartz ledge in Josephine county, and the prospects are first class for a permanent ledge. John Miller has rigged up his Farmer's Flat mines, and has good prospects for a profitable run. He has built a first-class flume and made a number of other improvements. An important discovery is reported from Sardine creek district. It is said that some newcomers have found a good-sized vein of rich ore, but we have not learned the particulars. Dr. Flanagan's Huntington mill is kept busy crushing ore from the Messenger ledge in Josephine county, and first-class results are promised. The doctor has done much for the mining interests of Southern Oregon, and is deserving of success. There is a fair supply of water already, and if the stormy weather continues awhile longer, an abundance is assured for some time. Miners are consequently elated, as the season promises to open considerably earlier than usual. The deal has been closed, we are informed, whereby the Patton ledge and its numerous extensions near Ashland pass into the hands of a Portland syndicate, who intend to develop the mines in the immediate future. The recent tests of the ore from these claims are satisfactory to the owners.

WASHINGTON.

CONCUNULLY.—Okanogan Outlook, Dec. 9: E. E. Gooding and T. C. Flynn have commenced work on a claim recently discovered on the north side of Peacock hill. Speculation is rife as to the meaning and probable result of the expert examinations of the First Thought mine. Evidently a deal of some sort is on the tapis. Mr. Luther Wagoner, a mining engineer of note from San Francisco, arrived on Wednesday's stage and is engaged in making an examination of the First Thought mine. John Judge, who has been working on his gold claims on Palmer mountain, for the past three months, has returned to Conconully for the winter. Harris and McLaughlin have built a cabin at the Rainbow and are making preparations to work on the claim all winter. Geo. Cooper and John Wentworth finished the assessment on the Standard and are now working on the Bondholder, a Palmer mountain gold claim. Mat Greenstate is working on the Georgie Moore, one of the most promising gold claims on Palmer mountain. The ledge is about 12 feet wide on the surface, but has not yet developed to any depth. Bob Hargrove and Billy Hunt are now at work in the tunnel on the diamond. They are in 130 feet on the ledge, which is over three feet wide. There is about 18 inches of good pay ore in the breast of the tunnel, and it is constantly improving.

MECHANICAL PROGRESS.

The Inventor of the "Bessemer Process."

The origin of what is now universally known as the "Bessemer process" of making steel has always been an honor divided between Sir Henry Bessemer of England and the well-known American iron-worker, Wm. Kelly. It is, however, quite generally believed by Americans that Mr. Kelly was really the original inventor, but through lack of means that he was unable to bring his discovery into general notice and use. Hence Sir Henry bore off the palm and profit. There is ample proof that before Sir Henry had ever commenced his experiments, Mr. Kelly had erected a little, old-fashioned, cheaply built furnace in Lyon Co., Ky., where he actually turned out steel on precisely the same principle afterward employed by Sir Henry in England. That old furnace is still in existence, but in a very dilapidated condition, and it is now proposed that it should be carefully taken down and with the original diminutive converter transferred to the Exposition grounds at Chicago, and there restored to its original condition, and placed among the exhibits at the Columbian Exposition.

If several photographs should be taken of the exterior and interior of the furnace, with its appointments as they now exist, and shown in connection with the restored work at Chicago, it would afford the most convincing proof of Mr. Kelly's priority of invention, and secure for this country, in the opinion of the thousands of visitors from Europe who will examine the exhibit, the just meed of credit which belongs to us. Mr. Kelly will have the credit of priority of invention, while to Sir Henry will be awarded the distinguished honor, to which he is entitled, of having made the same discovery at a later date and the further credit of having brought the invention into successful practice.

The Profits of the Bessemer Invention.

In this connection, it may be interesting to our readers to peruse the following remarkable statement of the profits of the steel process which bears his name, and which have been given to the world by Mr. Bessemer himself. He says: "Some idea may be formed of its importance as a manufacture when I state the simple fact that on the expiration of the 14 years' term of partnership of our Sheffield firm, the works, which had been greatly increased from time to time entirely out of revenue, were sold by private contract for exactly 24 times the amount of the whole subscribed capital of the firm, notwithstanding that we had divided in profits during the partnership a sum equal to 57 times the gross capital, so that by the mere commercial working of the process, apart from the patent, each of the five partners retired after 14 years from the Sheffield Works with 81 times the amount of his subscribed capital, or an average of nearly cent per cent every two months—a result probably unprecedented in the annals of commerce."

Furniture Manufacture in America.

The indications are that the time will soon arrive in this country, when it will not be the elegant thing to speak of a piece of furniture as being an imported article. American furniture designs are beginning to be recognized as the most really artistic of the period. Furniture made from American designs, may be a little heavy and may be more costly than that from French designs.

One of the prominent designers in New York, in a recent conversation with one of the editors of the New York Sun, pointed out two small inlaid tables standing together in his office, each equally artistic, but the one of American make more than double the cost of the importation. "The American table will last forever, the French one will break in three months, owing to the change in climate," he explained, "and yet we may tell this to one hundred customers and only the one exceptional buyer will pay the difference in cost. That is one of the difficulties under which the development of American art labors."

"Again, it is well known that we have no schools for study in this direction, for," continued the designer, in substance, "if we had the schools, who could be the professors and instructors in these schools of American art? Some one suggested that I should; but I am not capable of filling the place, and wouldn't accept it if I were competent. I have studied 18 years and don't know anything about it yet. The American designer has learned what he knows by hard knocks, not soft ones; by failures, not successes; by practical experiments, not theories; and he is not going to give the result of his life struggle for the stipend allowed to teachers of anything. He can only bid adieu to the world by giving those who follow him the results of his experience in his work."

"Just now the American style is, like the American people, cosmopolitan—its individuality has not crystallized, and yet it is unlike anything on the other side. There are so many and such diverse views upon the subject that no one is able to set himself up as leader. There are 50 men of authority in this branch of fine art. If one of the 50 announces his view as the right one, all the other 49 rise up and dispute him, and each of them is equally as

right as he, because we have as yet no established standard. Americans, in reality, are studying the best the world has known in all periods, and from them are evolving American art. But we are too young a people to have a definite idea of our peculiar style familiar to the world outside the profession. We must have years, not only to perfect our individuality, but to impress it upon the world and to elevate public taste into creating a demand for our best results, even at an advance in price. The American designer originates his idea, formulates a rough little outline of it, hands it over to his French and German draftsmen, who work it out with the patience and painstaking skill which the designer is in too much of a hurry to spend his precious time over. This design is executed, and when completed is sold to the connoisseur who appreciates the difference in the durability and beauty of the home product, and willingly pays the advanced price. "We shall no doubt, eventually be able to establish an American School of Design in this particular branch of industry, with marked characteristics by which it may be distinguished, and by which its authority will be acknowledged. Then will come the time when the American product will be at a premium because it is American."

STEAM VS. WATER FOR THE GRADUAL REDUCTION OF TEMPERATURE.—Water is a good lubricant when rightly applied; but hot steam is better than cold water for reducing the temperature of a hot journal or guide. A knowledge of this fact, says the *Railway Review*, and the wit to use it at the right moment recently helped an engineer out of a tight place. He had to take the superintendent up the road on his engine to an important meeting. The superintendent was in a hurry, and they started out at a pretty lively pace. Everything went smoothly for awhile, when the guides on the right-hand side began to smoke. The engineer shut off, got down and found that guide in first-class shape as a frying-pan, but its efficiency as a guide was seriously impaired. The superintendent got down, too, and said: "Put some water on her quick." "No, sir," was the answer; "if you put water on that guide now, you will twist it all out of shape." "What are you going to do?" said the superintendent; "we haven't much more time than to get there now." The engineer said nothing, but he took his wrench and eased off the nuts on the stuffing-box studs enough to allow the steam to blow through past the piston-rod. He reasoned that the steam blowing through on the hot guide and condensing would cool it just as effectually and much more gradually than eight or ten buckets of water dumped on at once, while the water would at the same time act as a lubricant. They got up and started ahead easy. The engineer watched that guide with some anxiety, for he was not sure of the result. At the end of ten miles he stopped, went down and felt it. With a calm smile and an "I told you so" expression, he pulled out the throttle, drove ahead, and brought the superintendent to his meeting in time.

A COMBINATION OF IRON AND OAK PAVEMENT.—At the November meeting of the American Society of Mechanical Engineers, a paper was read by Mr. I. W. Cole descriptive of a combination of iron and oak pavement, which consists of cast-iron pockets and bottom plates with oak blocks. The pockets are filled with green oak 3-7-16 inches square on the top and about 5 inches long. The blocks are driven into the iron pockets some 3 inches, and receive the traffic on the end of the grain of the wood. Each full-sized bottom plate has five pockets, four half-pockets and four quarter-pockets. Thus, at the joints of the bottom plates in some instances, two, three or even four bottom plates may support one of the hardwood blocks, dividing the strain and holding an even surface on the upper side of pavement. Each iron pocket has a small hole for draining away any moisture. This block pavement, said the writer, was put down May 30, 1890, with the newly sawed oak blocks projecting two inches. In August, 1890, it was inspected and found them hammered and worn to 1½ inch projection; and in September, 1891, another inspection showed them projecting about 1½ inch above the metal pockets. The traffic crossing it includes largely loads of roofing slate and of rough earth-stones, and loads of from 3 to 5 tons each are quite frequent.

NO MORE BURST PIPES.—Much annoyance and no little expense is often met with in freezing weather from the bursting of water pipes. An Englishman, however, has recently devised a way to avoid such trouble. It consists in attaching a cup-shaped air chamber to a piece of pipe, which can be coupled at both ends with the pipe to be protected. The air chamber is separated from the water flowing through the pipes by means of a rubber diaphragm. In case the water in the pipes freezes, the expansion of the water, instead of finding an outlet by bursting the pipe, simply forces the diaphragm to yield, thus compressing the air cushion within the cup. It is said that a pipe so protected will have entire immunity from bursting by frost.

AMERICAN SCREWS IN EUROPE.—It is said that the demand for American screws is so great in England and Germany that a screw company of Providence has established a branch factory in Leeds, England, and will soon put up another on the Continent.

SCIENTIFIC PROGRESS.

Science in the Mine and Shop.

There is a somewhat diversity of opinion among the masses in regard to the value of scientific knowledge in the mine—less so, however, in the shop. Some one has said that "If we took the greatest chemist in the world, he would not find much exercise for his chemical skill in the management of a coal mine. It would be like cutting blocks with a razor." To the above it has been replied that "It is quite true that if the greatest chemist in the world were placed in a coal mine, he would find very little scope for the exercise of his analytical dexterity, or for the application of those recondite scientific principles with which he is familiar. But it might be affirmed with equal truth that if the greatest mathematician in the world, the man most thoroughly conversant with the laws of dynamics, were charged with the management of a fitting shop, his mathematical formulae would be of very little use in the direction and management of the men under his authority. Neither great endowments nor lofty scientific knowledge are immediately available in the ordinary routine business of life, their value being manifested in the discovery of rules or the invention of processes which men of another stamp put to practical use."

Scientific knowledge in the ordinary superintendence of mine work, whether in coal, silver or gold, is of very little use, a great many people have been wrong in expending large sums of money, both in this country and in Europe in encouraging the establishment of mining and technical schools. True, it may be difficult in coal or gold mining, for instance, to say just where and when the scientific knowledge may come in. We are writing just now of the mine and not the mill or furnace.

In this line of thought, a gentleman of large experience wrote, some years since, as follows:

The Value of Scientific Knowledge

"Lies chiefly in the improvement of the man himself who possesses it, in the sharpening and strengthening of his faculties, in the formation of just habits of thought, and in the aptitude which it communicates of dealing with unforeseen circumstances as they arise. It does not teach him to do anything which men of practical experience only cannot do; but it teaches him to do many things in the right manner, and at the right time, which they might not think of doing at all. A man familiar with the ordinary phenomena of chemistry, and well instructed in the laws of that science, would be so much better qualified to deal with ventilation than if he knew nothing of the composition of the atmosphere, and this for the simple reason that he would more readily and keenly appreciate the importance of an abundant supply of fresh air. It is quite true he could do nothing extraordinary toward averting an outburst of gas, or neutralizing the disastrous effects of an explosion; but, in proportion as he understood the danger, he would be the more vigilant in adopting the necessary means for guarding against it. Coal-mines are infested with other gases besides carburetted hydrogen, and it is of great importance to the health of the workmen that they should be cleared away as fast as they are discharged."

The man of scientific knowledge, though possessed of no specific, nor master of any conjuring process for expelling them, is yet better qualified than an ignorant man for dealing with them, because he understands not only their nature when he encounters them, but also their injurious influence on the health and spirits of the workpeople.

A scientific knowledge of mechanics is useful to many classes of officials employed in connection with mines, not because it lets them into any secrets for doing work more economically or more expeditiously than ordinary workmen can do it, but because it opens their eyes so that they can see when work wants doing, and awakens their faculties to the right time and the right mode of doing it.

In an extensive and well-organized system of industry, whether in a cotton-mill, a mine, or elsewhere, the greater part of the people employed are restricted to one simple and monotonous duty, in the performance of which scientific knowledge can render them little assistance. Yet even in the superintendence of a machine, there is a difference between intelligence and stupidity, which is to the advantage of the former. In the case of officials invested with authority or intrusted with a discretionary power, a man with a little mental cultivation can discharge his duties much more to the satisfaction both of his employer and his fellow-workmen than will one whose faculties have never traveled beyond the limited sphere of his own observation.

In few departments of industry have there been of late years so many and such signal improvements as in that of mining, and all these improvements have been framed more or less closely in conformity with scientific principles. It is true that many of them have been introduced by shrewd practical men, with no guide but their own sagacity, assisted by experience; but it is equally true that such men have previously spent an infinity of labor to little purpose, which labor they might have spared themselves had they possessed a little scientific knowledge, and thereby become acquainted with what others had done before them.

Few of our readers will have much difficulty

in calling to mind cases where men have raised themselves to respectability and competency and opened out the means of livelihood to hundreds of people around them through their knowledge of science in general, as applied to the various industries, and to their knowledge of geology, in particular, as applied to the various departments of mining.

But why need further reference to this matter, which has been under consideration for the last 50 years or ever since the first Mechanical Institute was established, to collect and disseminate industrial knowledge among both employers and employed? The establishment of technical schools in Europe was the means by which that continent took and has kept the advance step in the industries up to the present time. It has been by means of those schools that the managers in her mines and in her shops have led the world of industry.

The best test of theory is to be found in results, and we believe that whether in mine, the shop, or the field, those countries and those districts where most is done for the promotion of education among the masses have become the most prosperous communities. It is there that the workmen get the highest wages and the employers universally realize proportionate profits. Of course these observations, like all others comparing the results of knowledge with those from ignorance, is based on the assumption that in all other important points the cases are equal. No superiority of knowledge or management will make a poor mine a rich one, but it will, in every case make a poor mine pay better than though it were worked under ignorant, or vicious management. Of course, no education will make a block-head as capable as a man naturally endowed with a quick apprehension and sound judgment. All we claim is that a man with length and breadth of experience, supplemented with a thorough scientific education, will make himself more useful in any calling, than a man with any amount of experience, but totally deficient in scientific knowledge.

PRINTING UPON METALLIC SURFACES has heretofore been a very difficult work, especially when it has to be done in colors. Hitherto, all impressions upon metal have been obtained by the transfer of a freshly printed sheet, or by the transfer of the impression upon a sheet of rubber to a sheet of metal. To this effect, it is necessary to construct special lithographic presses in order to obtain an exact adjustment of the colors forming the subject. In order that the printing may be done directly from a hard surface, that is, the lithographic stone, upon another hard surface, that is, the metal, it is necessary to be able to render the metallic surface elastic enough to take the ink that the stone carries, without impacting or destroying the details of the subject. In order to reach such a result, the process employed is as follows: Upon the metallic surface to be printed, there is produced by the mechanical action of very fine sand, a fine and close grain, which is diluted and cleaned by immersion in different alkaline solutions. This roughened and velvety surface takes a lithographic impression as well as paper and fabrics do. Immediately after the printing, the sheet of metal is submitted to a temperature of 50 degrees in a special stove, the object of which is to cause the ink to enter the pores. The impression is, therefore, no longer superficial, but is printed in the metal itself, whose expansion and contraction it may follow without undergoing any alteration. The metallochromic prints, covered with two coats of varnish, applied hot and fixed in a stove, present the same characters of durability as enamel and enamel.—*La Nature*.

A NEW USE FOR CORN.—American corn seems to be fast working its way into use in Germany. The failure of the European crops has recently given it quite a new impulse. But there is another use for that product which has been gradually being developed for several years, and which now promises to assume an important place in a German manufacture—that of soap. Hitherto manufacturers have used linseed oil, procured in Russia, but owing to the failure of the crop there, they were compelled to look in other directions for a supply of oil. East Indian linseed oil has been tried, but the experiment was unsuccessful. An eminent chemist, after many experiments, decided that the oil obtained from corn was the best suited for the uses of the manufacturers. The supplies for this purpose are now being obtained from Chicago, and the chances are that the trade will soon reach very large proportions—reach far up into millions of bushels annually.

THE INTENSE BRILLIANCY OF LIGHTNING.—One consequence of the short duration of lightning is an apparent diminution of its brilliancy. It has been proven that light cannot produce its full effect on the eye unless it remains at least as long as one-tenth of a second; but lightning lasts only the ten-thousandth part of a second, and it follows from this that what we see is one hundred thousand times less bright than it really is. When we recollect that even thus diminished, its brilliancy is such as to cause temporary blindness, if too closely watched, we may feel grateful that we cannot see it in its true vividness, for our human powers of vision would be too weak to bear such a sudden and overwhelming illumination.—*Gairland's Electricity*.

HOT WATER cannot be raised to any considerable height by suction.

ELECTRICITY.

Late Electrical Devices.

Among the late electrical devices may be mentioned a motor especially adapted for the use of students and for experimental purposes, intended to be operated by static charges, and which may be used with a different number of coils, or have the electricity thrown upon one side of the main disk only, is shown in perspective and vertical cross section in the accompanying illustration.

A new electric heater is attracting much attention among railroad men at the East just at this time. Many of the electric roads in this country and Canada have them upon their cars and express satisfaction with them in enthusiastic terms. The points which call forth the greatest comment are the neatness and economy of space, labor and the money which attend their use. Scorching of car ceilings is prevented. No room desired for other purposes is required by the heaters. Fewer men are required to produce the same results as are obtained from stoves; that is, less attention is required to secure the same efficiency. Formerly it required the attention of some one to obtain the proper coal for the stove and of some one to place the proper amount on each car. Now the fuel for heating is simply more of the same as that used for the power station engines used at the same place and this fact does away with all the care of separate stoves. The only necessary work is the tending to a single switch which at most would require not over three minutes a day, while the results are apparently all that could be desired—comfortably heated cars, and absolute immunity from fire in case of accidents, collisions or in any way.

A new electrical fire-extinguisher has been devised, which is operated by the fire itself, wherever it may start. A chemical generator of sufficient capacity is first provided, and from this, pipes are carried into each room in the building. Attached to the ceiling of the room is a jar, in which acid is restored, and inside of which a cartridge is placed. An open circuit battery is used. The thermostat in each room is set at any desired degree, say at 80 degrees. In case of fire the mercury rises to this figure, and the circuit is closed. This explodes the cartridge in the jar, a valve drops, and the chemicals are precipitated into the room through a series of sprinklers. There is also in connection with this device a system of dry pipes, and if it be found that the chemicals will not extinguish the fire, an officer on the outside of the building can determine by the annunciator in which room the fire is located, and by turning a switch can flood the room with water without going inside. This system can also be made automatic.

An improved phonograph, in which the ordinary wax cylinder is replaced by a continuous ribbon, is a most useful improvement, and will, no doubt, do much to secure for that instrument a more general introduction. On the ordinary cylinder now generally employed in phonographs, the greatest length of record, expressed in time, is considerably less than eight minutes. With a machine employing a recording ribbon an almost unlimited length of record could be made. A ribbon is not liable to be affected by variations in temperature, which tend to make the ordinary cylinder brittle and more or less inoperative and defective.

An automatic electric gas extinguisher is a late and useful device, which depends for its operation on the variations in the electrical conductivity of selenium when exposed to light. It will be employed for automatically extinguishing gas in stores where it has been allowed to burn all night. At the first gray streaks of dawn the selenium is acted upon, and the result is that the gas is turned off.

We learn from one of our exchanges—a technical paper of standing—that a friend, an inventor of some note, is working upon what he thinks will be a "big thing." His idea is the construction of a chemical plant which will generate and store at a small expense, enough electricity to maintain 25 or 30 lamps on a small system, say in one house. He has one that feeds half a dozen lights now. The chemicals used are new in the electrical field. He thinks he will get it in time so that a residence can be wired with a chemical battery and storage cells in the cellar which will have to be replenished only once a month.

Accidents From Electricity.

There is a senseless howl continually kept up, more especially by the daily press of the country, in regard to the great danger arising from the continually increasing use of electricity. Of course accidents will happen as long as people will be careless. In spite of all precautions taken by companies using electricity, their employees will get careless, and other people will be careless also. But this is a progressive age, and improvements must be allowed to be introduced, whether people are careless or not. True, now and then accidents occur, which are not the result of mere carelessness; but such accidents are probably less frequent in the use of electricity than in almost any other important line of progress. Steam, more than any other innovation during the past 50 years, has had its holocausts of burning, scalding, killing and mutilating human beings; but who ever thought of forbidding the use of that great modern agent of progress? We need not

mention the steam railroad, although, in proportion to the numbers, even in regard to miles, which it has transported, its destructiveness to human life and limb has been decidedly greater than has accrued thus far from electric roads.

A great outcry has been raised against what the daily papers have denominated the "deadly trolley wire," and yet the record in New York City shows that within a period of only 60 days, no less than 29 people were either killed or suffered serious injuries from horse cars in that city—a record which cannot be paralleled by the use of electricity anywhere. Even in this city a most acrimonious war is now being waged against the erection of poles for the trolley system on the Folsom and North Beach street railroad, and that even after a franchise has been granted for that purpose!

Safety Appliances.

The advent of electricity as applied to the solution of street transportation in large cities is proving a decided success over all other methods, whether horses, steam or cable. This is true, whether regard is had to economy in construction, in operation, or safety to passengers or pedestrians. Evidence in regard to each of these particulars has already become cumulative, and improvements are continually being introduced both in regard to economy and safety.

It is not only in street cars that safety appliances are being devised, but in every other department of electric engineering as well. One of the means of immunity from danger from wires lately introduced is a safety fuse, or "bug," as it is called by the electricians. This "bug" has been devised for application more particularly to electric light wires. It consists of a little oblong wooden block, carrying, by means of two brass screws, a bit of very soft wire. The current to each lamp goes through this bug, instead of passing over a continuous wire. Then, if there's trouble anywhere on the line, such as wires crossing, a short circuit or a "ground," the current, which is trebled at least, fuses the soft wire and the circuit is broken, the lamp goes out, and there is little danger of fire or personal injury. The extra current would otherwise break out through the weakest point, and might fuse the socket of the lamp and blow it all to pieces, or escape through a bad connection and start a fire.

Our readers are well posted as to what has been done in Frankfurt in the way of rendering wires safe for the conveyance of electricity on the largest scale; also what Edison is doing in the same direction in regard to the use of electricity for propelling railroad trains; also the claims put forth in an apparently authoritative manner by the Oregon electrician, Crouse, who places and crosses the positive and negative poles of an electric light wire in his mouth without harm. In short, we are just upon the fringe of what is yet to be done with electricity, both in regard to its use and safety.

The constructors of street cars for electrical propulsion and the companies operating them are keenly alive to the fact that it is to their interest to devise every possible safeguard for the comfort and protection of those who ride in their cars. Very few cars for either horses or cable are now being built at the East. One of the largest street-car builders in New York recently informed the editor of the *Street Railway News* that during the past year he had not built a dozen horse cars, but that the entire capacity of his factory had been confined to the construction of cars to be propelled by electricity.

General Improvements.

It is stated by one of our New York exchanges, as a very significant fact, that not only break-downs in the apparatus of electric railroads are less frequent than a year ago, but that accidents to life and limb are also diminishing. This result is due to two circumstances—greater experience and improved construction. The trolley system has recently been greatly improved and made more substantial and reliable. The motors have also been much improved, so much so that it would seem as if in that direction electrical engineers have well nigh reached perfection.

The fact that engineers, inventors and operators are at the present time giving such marked attention to every detail in the way of possible improvement in economy and safety, in the equipment and everything connected with electrical progress, is a most healthy sign that all occasion for complaint will soon be done away with in regard to the general introduction of this new agent of civilization and industry. First-class work and first-class intelligence, with a little patience on the part of the public, will soon remove all objections to this latest, best, and, in the near future, cheapest servant which nature or invention has ever vouchsafed to the human family.

PELTON WHEELS AND ELECTRIC MOTORS.—R. S. Hunton, one of the leading mine-owners of Colorado, says that electricity opens up a new era for mine development in Colorado, as well as in other localities. Many mines in the higher altitudes, of great promise, have been almost valueless on account of exporting fuel to them. Now, with Pelton wheels and electric motors, mines in the most inaccessible localities can be reached and operated at less expense than those most favorably located as regards fuel supply. The several plants of this character now running at Aspen, Ouray, Telluride, and other places, have demonstrated beyond all question the practicability and economy of this system.

GOOD HEALTH.

The Leucanthemum Correspondence.

Somebody has said that an observant, thoughtful man can learn as much from the mistakes of his fellow-men as from their wisest and most successful actions.

When Mr. Geo. F. Waters told the readers of the *Press* that leucanthemum taken into the stomach would correct its sourness, he no doubt believed he was right, but the note of your correspondent M. L. H. shows that he was mistaken by its simply saying that chewing a bit of soft pine would have had the same effect. As explained, it was the creating and swallowing of saliva, an alkaline secretion, which did away with the acidity of the stomach, and a sliver was just as good as an oxeeye daisy for that purpose.

Mr. Waters, it must be admitted, "came over us" just a little by using a long, jaw-twisting word to describe the beneficent plant which, under his discovery, was to become a great blessing not only to human beings but to cattle troubled with fullness of the digestive organs. If he had used the common name of the plant, the glamour of learning which gave prominence to his utterances would have been absent and few letters would have been addressed to him.

I must not be hard, however, on Mr. Waters, for without really intending it, he has shown that truth may be evolved from error when mind acts upon mind through the blessing of printer's ink. The important result of the correspondence is this: That if we are to eat in a way to get the highest possible nutriment from our food, we must chew it so well while we are at table that recourse to pine slivers and oxeeye daisies afterward to create saliva will be wholly unnecessary.

Considering the fact that man's strength, wisdom, success in business, family happiness and general usefulness in his day and generation depend, to a very large extent, on the complete assimilation of his diet, we can understand that eating is one of the most important, yes, one of the most serious matters, of daily human duty. The man who eats as if he were trying to get rid of a disagreeable undertaking displays neither wisdom nor refinement in his pell-mell gorging habits. Why should he by pure thoughtlessness, by hurry, or by absolute ignorance, be the enemy of his own body and the scourge of his family by his eating like a fool and not as a considerate being capable of assigning effects to causes—Indigestion to careless eating as one of them, for instance. If Thos. Carlyle, "the shaggy old lion," had studied how to eat before he studied multitudinous tomes of learning, he would have been a still greater thinker and writer than he was—in spite of himself—and poor, fretting, neglected Jeanie Walsh would have found him a better husband than his rebellious stomach would suffer him to be. "Know thyself" is a sage's counsel, but "know thy stomach," do not give it overwork; think what thou art doing when thou art eating; consider the fact that thy blood is thy life, and that it is at the table where that blood, and therefore thy life, is to be rightly or wrongly supplied, are words of counsel to which thinking men ought to give heed. It is of more importance to the individual man that he should be able to diet himself, so that he may and his earthly days like a fully ripened ear of grain, than that he should have the power to weigh the stars in their courses or measure the orbits of the comets coming within his ken. A giant mind trammelled with an indigesting stomach can never fully display its powers.

But not to encrease much further on your space, I wish to give a few hints to those who, after meal hours, find that there is rebellion being organized in their stomachs, and something must be done to check it, consisting neither of oxeeye daisy nor bite of wood taken into the mouth.

Here they are: Get hot water. To make it palatable, if that is necessary, put sugar or orange jelly into it; take a small slice of dry, light bread, chew it very slowly and thoroughly so that it may carry down as much saliva as possible to destroy the rebels. Then drink two good cups of this hot water, for by means of it as a conveyor, the saliva will reach every point where it is required.

If there is a painful fullness experienced, lie down on the left side for a short time and relief is sure to come.

If, however, a human stomach has for years and years been abused by the dumping into it of half-rotten food, with never a screen to hold back the coarse pieces, it will be no easy matter to make it a thoroughly effective servant of its owner. It is at meal-time that the preventive for indigestion can be best applied.

It is a sad thing to see a man whose love of table luxuries drives him to the digging of his grave with his teeth. It is sad, too, to learn of men, women and children dying because they are unable to give their teeth legitimate activity.

When we see intelligent people bring dyspeptic misery upon themselves through sheer thoughtlessness as to the extent to which their teeth ought to be used, one feels that here is the widest field of all for active commiseration. Mothers, if you are ambitious to have your children distinguish themselves in life by noble actions, see to it that as far as circumstances will permit, they may have well-informed minds

in carefully nourished bodies. Teach them how to eat; when to avoid drinking; and impress upon their minds the advantages of open-air exercises. If added to these bestowals, you teach them how to find the narrow way from earth to heaven, you will have conferred blessings which shall "drop like the rain and distill as the dew" long after you have passed away.

JOHN DARE EMERLEY.

USEFUL INFORMATION.

A PRACTICAL INDUSTRIAL SCHOOL.—Comparatively few people are aware that Chicago has a building almost wholly built by the students of an industrial school. The new building of the Institute of Technology, 147 Throop street, is the first building west of New York City ever put up wholly or in part by students. No better evidence of the practical character of the instruction of a school could be desired. The teaching of trades is in accordance with the broad plan of this institute which proposes to teach "Any person, any study, day and evening." It has classes in electricity, plumbing, bricklaying, as well as architecture and engineering. Dranghting of all kinds is made a specialty. A desirable opportunity is thus offered young men who desire to learn a trade, in a country where trade unions are keeping American boys from the shops to make room for adult foreigners who come to this country to "earn a living" by means of trades learned abroad. There should be hundreds of such schools where there are now but dozens, and there soon will be. The American people will see to it that ample opportunity shall in some way be afforded for "our boys" to learn trades by which they may be able to earn an honorable living.

UNWISE LEGISLATION.—A contemporary says that this is an age of novel legislation. In Indianapolis a school of thinkers, or political economists, are seriously advocating a law levying a special tax on wagons, because the wagons wear out the roads and create the expense of maintaining the streets. It is said such a law is in actual operation somewhere in Europe. The theory is that the man who does not own a vehicle does not wear out the roadway and should not be asked to keep it up. It sounds plausible and equitable to some people. The same reasoning would place the expense of maintaining the sidewalk on the persons who do not own vehicles. Applied to the public schools, the principle would heap all the expenses of school maintenance on married men having children, and the bachelors would go free. Bachelors and Benedicts all receive some benefit from public education. Everybody finds the streets, roadways and sidewalks useful. No wise law-maker undertakes to adjust all the inequalities of taxation. A man who is the happy possessor of a dozen children, in a mathematical sense, receives twelve times as much benefit from the public schools as the man who is not blessed with any progeny. Public conveniences are furnished as nature furnishes air. We use what we need.

HOW TO CLEAN LOCOMOTIVE FLUES.—Various devices are used for cleaning out the flues of locomotive boilers; but as a general thing, the devices employed are very unsatisfactory in their operation. Some time since, an Oakland engineer, Henry Orth, happened to be standing by a roundhouse fireman as he was busily engaged in cleaning the flues of a locomotive with what was then considered the best instrument in use for such work. Orth carelessly remarked that he thought he could improve on the rod and worm which the fireman was using. "How will you do it?" was the reply. Without any further remark he started off to the shop in a thoughtful mood, and soon returned with a long iron pipe near one end of which he had drilled several holes, and attached an air hose to the opposite end. Then he ran a locomotive up beside the one to be cleaned, and attached the air hose to the hose on the live engine. The pipe was inserted in the flue, and when the air was forced in, it scoured out the flue like sand and paper. Since then Orth's patent has been generally used, and it has always given satisfaction.

ROPES FOR MINING PURPOSES.—From a report recently made to the French Government, it appears that hemp or aloes ropes are almost exclusively used for all depths of shaft in Belgium. The makers guarantee the ropes to last one and a half to two and a half years, and should they fail earlier, a twelfth to a twenty-fourth of their cost is deducted for every month short of their stipulated duration. Steel wire ropes when used for mining purposes, should be of crucible steel having a breaking strength of 70 to 76 tons per square inch. Large pulleys are more necessary for wire than for hemp ropes, the smallest diameter permissible being 1,300 to 1,400 times the diameter of the wire in the rope, if of iron, and 2,000 times if of steel. Wire ropes are best made with a hemp core, being more flexible.

CHEAPENING MACHINERY.—A few years ago a pumping engine for town or city water supply was a rather formidable, as well as a costly piece of machinery—something no moderately small town could ever hope to own and operate. Pumping engines were luxuries for large cities. Now, engines are made for such purposes, so moderate in cost, and so easily erected and managed, that any ambitious town of a few thousand inhabitants cannot afford to be without good water.



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SAN FRANCISCO:

Saturday, December 19, 1891.

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Passing Events.

The miners in different mining counties of the State are holding meetings and appointing delegates to attend the Miners' Convention, which is to meet in this city on January 20. The necessity of a permanent organization of miners is now generally recognized, and their interests will be better cared for than when left to individual effort, as has been the case in the past.

The fact that the supply of paying ore in the New Almaden quicksilver mine has about given out, and that many miners have been discharged will doubtless lead to more vigorous development and prospecting of other quicksilver claims in California. Already some of those persons interested in the New Almaden have purchased the Bradford quicksilver mine, Lake county, and will make a big mine of it. Other mines will also be opened in other counties.

An English company having bought the Quartz Valley hydraulic claims in Siskiyou county will operate them to the fullest extent during the coming season. This is one of the good effects of legally declaring the Klamath river a nonnavigable stream, for here will be no trouble about the debris.

The next number of the PRESS will not reach

our readers until after Christmas Day, so it becomes us to express good wishes now. To all our friends, both distant and near at hand, we extend the compliments of the season and a wish that to them all may come a "Merry Christmas."

The Patent Office Business.

The annual report of the Secretary of the Interior, just published is for the fiscal year ending June 30th last. In this, a summary is given of the work in the U. S. Patent Office. It appears that, including applications for patents for inventions, for designs, releases, for the registration of trade-marks and labels, and for caveats, the total number of applications received was 45,949; number of patents granted, 25,307; trade-marks and labels registered, 2,033; patents withheld for non-payment of fee, 3,514; patents expired, 12,383. The total receipts were \$1,302,749.39, and the expenditures \$1,145,502.90, leaving a surplus of \$157,291.69 to be turned into the Treasury, and increasing to \$3,947,847.97, the amount in the Treasury to the credit of the patent fund.

From the statement published it is seen that the unusually large number of applications for patents during the year ending June 30th 1890, was very nearly equaled by the number issued during the past year. In these two years nearly 10,000 cases have been presented beyond the average of 1888 and 1889.

Many persons suppose that, in view of the great number of patents already issued, there is a falling off in number of applications. But the contrary is the case. Patented inventions are increasing. In fact, even with increased force the Patent Office has hard work in "keeping even" and more examiners are needed to meet the increase in the volume of business.

While, as stated, the number of applications for patents is increasing, notwithstanding the great number of patents already issued, it is no longer such a very easy matter to get an application properly through the office. So many "references" are made to previous inventions in these days that a knowledge of the state of the particular art is absolutely necessary to obtain a patent of any value, and get it within reasonable time. Only experienced patent agents should be employed to draw the specifications and attend to the case while in the office. Otherwise the inventor is liable to vexatious delay, and if he gets a patent, it is not apt to stand the test of the courts. The multiplicity of patents necessitates the most careful work in the preparation of papers for new ones. The description must be unmistakably clear and the claims so drawn as not to interfere with those of patents already issued. It is only people of long experience who can do this work, and inventors are foolish who entrust such important business to firms with no reputation to maintain, or men who have never had more than a dozen or two cases.

SILVER IN THE SOUTHWEST.—A dispatch from El Paso, Texas, dated Dec. 15th, says: The Southwest Silver Convention was called to order by Chairman Longmear of the Bullion. About 500 miners were present and fully 600 are delayed by storm-bound trains. The address of welcome made by Juan S. Hart of the El Paso Times was responded to by Governor Prince of New Mexico. Ex-Senator John H. Reagan made an able appeal for free coinage, handling the financial questions of the country in an exhaustive manner. William Burne, Speaker of the New Mexico House of Representatives, was made temporary chairman. Later the convention adjourned to witness a bull-fight in Juarez. It will reconvene in the morning.

STRIKE IN GAS.—There is considerable excitement in Salt Lake because of the strike of natural gas, with a pressure of 145 pounds to the square inch, in the six-inch well at Lake Shore Station, 12 miles north of this city. The well reached the Trenton rock at a depth of 550 feet, and the gas rushed up under the suddenly increased pressure with a roar that was heard for a long distance; but the well leaked, and the gas, seeping up through the ground, caught fire at 10 A. M. The Manager of the Gas Company, Mr. Schmidt of Kansas City, and an assistant, were caught in the flames and barely escaped cremation. The fire burned the neighboring buildings.

A Point from Mr. Mackay's Testimony.

When Mr. John W. Mackay was testifying in the Hale and Norcross suit, he was asked "If the custom of the mills claiming the tailings did not grow out of the old contracts," to which he answered: "Yes. In those days the mines holed and assayed their ore, and sold them to the mill for 65 per cent of the mine assay value. When the mill had accounted for the 65 per cent mine assay, then all the balance belonged to the mill, but there was no charge for milling." Then Mr. Mackay was asked if ore which assayed at the mine \$72 per ton was not very badly worked if it returned only \$40 per ton. In reply, he said: "Yes; because they should account for 65 per cent of the mine assay at the very least."

According to one of the hooks put in evidence in the suit now pending, it was shown that the mills returned less than 52 per cent of the mine assay of the Hale and Norcross ore taken out and milled in the years 1888, '89 and '90, and, in addition, charged \$7 per ton for milling, besides keeping the tailings. The mill charges, too, were made in the face of the well-established fact that ore can be milled now for much less than it could have been ten years ago. There are responsible millmen who will give bonds, too, for its faithful carrying out, who would be glad to get a contract to mill the Hale and Norcross ore and pay the company 70 per cent of the mine assay value and make no charges for milling."

Fumes from Roasting Ore.

The people of Butte, Montana, are having lots of trouble with the fumes from the ore-roasting heaps of the Boston and Montana smelters. The fumes of sulphur are almost unendurable. The roasting of ores in heaps is in violation of a city ordinance. The Butte and Montana, after a suspension of three weeks, during which interval the city was rid of the fumes, announced that they would test the validity of the ordinance. Accordingly heap roasting was resumed at Meaderville by this company.

The action aroused great indignation, and it required the counsel of the most conservative citizens to avoid mob violence. At a mass meeting of prominent citizens held in front of the City Hall, the Mayor's action in sending a large force of men to Meaderville, to cover up the burning ore heaps with sand and smother them, was unanimously indorsed. Two hundred men, drawing pay from the city at \$3 per day, were put to work, and more will be added if necessary.

One of the resolutions adopted by the Citizens' Committee reads as follows:

Resolved, That it is the sense of the people of the city of Butte and vicinity, expressed by the proper committee having the matter in charge, that the Boston and Montana Copper Company in again setting fire to the heaps, in utter disregard of the laws, is guilty of one of the greatest and most atrocious crimes ever committed in a civilized country; that we believe a number of deaths have already been hastened in the five days their heaps have been burning; that a fatal epidemic will be precipitated if they are allowed to continue their inhuman and monstrous course; that self-preservation is the first law of nature, and that the people of Butte will not permit said corporation or any other to longer stand in its way of the full enjoyment of its rights and liberties, and that this death plague must be stopped at all hazards."

The Practical Catechism.

This is the title of a neat little work by Robert Grimshaw, which is a collection of questions on technical subjects, by manufacturers and others, and the answers thereto, published by John Wiley & Sons, and for sale by Osborn & Alexander of this city. The price is \$1.25. The questions answered emanate from manufacturers, owners, railway men and those of a hundred diverse occupations. Some have been answered in periodicals and others in legal contests. Out of the great mass of material at hand in his note-books, the author has selected those which he thought would most interest the largest number of practical men; and it is to this class of readers that the volume is addressed and commended. Most of the examples are drawn from actual practice. There is an unusually extended alphabetical index. The book is arranged by question and answer, and the language clear, plain and concise, as is the case with all this author's works. The book is really a very useful one and exceedingly handy for reference, the "catechism" embracing such a wide range.

Miners' Meetings.

In view of the coming Miners' Convention in this city (January 20th), several miners' meetings have already been called, in order to select delegates. Others will follow. Each county in the State is entitled to 30 delegates, except San Francisco, which is to have 60. A meeting of mining men will be held at the Mining Bureau at 3 P. M. next Tuesday, to take action toward selecting delegates for this county.

In Nevada county this week, some 300 representative hydraulic, drift and quartz miners assembled and organized the County Miners' Association, with Alf Tregidgo, superintendent of the Peabody and Washington quartz mines, as president. Thirty delegates were elected to attend the State Miners' Association at San Francisco, January 20th. There was an utter absence of rancor and demagogism in the proceedings, which were marked with earnest enthusiasm.

The resolutions adopted declare that gold and silver are requisite as a basis of credit, and emphasize the faith shown by Government engineers that there are over \$300,000,000 worth of gold in gravel channels that can be mined with safety to rivers and farmers by the outlay of \$1,500,000.

They recommend that Congress provide for constructing dams, and that engineers certify as to their efficiency before using. They suggest the alteration of the mining laws so as to simplify proceedings for Government patents and abolish the presumption that mining claims will not pay, until proof has been made of their value.

These are practically the same suggestions that will be made by all the miners, and the same as those stated in the address issued by the Placer county miners, published in the PRESS, last week.

For Engineers and Firemen.

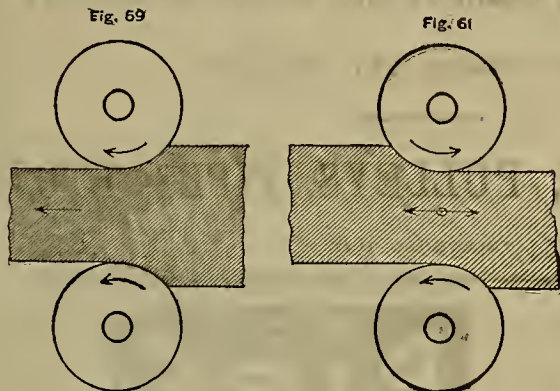
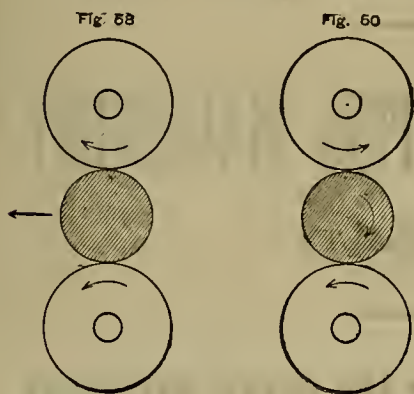
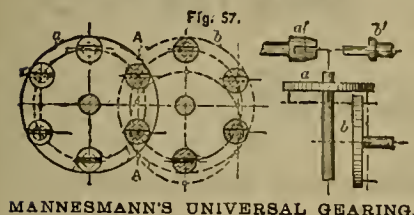
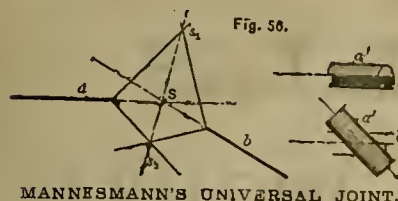
"Edwards' Examination Questions and Answers for Engineers and Firemen," is a little book, but a very useful one for stationary and marine engineers and firemen who desire to obtain a U. S. Government or State license.

This work is by an old and distinguished author (Emory Edwards), who enjoys considerable celebrity in treatment of industrial topics and engineering industries. This very complete book elucidates quite distinctly some of the most important operations in engineering practice, exhibits in a graphic manner the plans to be adopted and measures necessary in cases of emergency, and explains in a manner quite easily comprehended, the duties to be performed by all who are connected with steam engines and points out the easiest manner of accomplishing them. Here is a work comprising information on the most important questions and duties in connection with the application and management of steam engines of every form and style constituting an invaluable guide in all technical occupations and an essential companion for the engineer and fireman.

Principles and practice are clearly exhibited, and engines and boilers, with their appurtenances and auxiliary appliances, are fully discussed. H. C. Baird of Philadelphia is publisher, and the agents in this city are Osborn & Alexander. The book only costs \$1.50. It was not gotten up for the use of experts or educated engineers, but on the contrary, for the great number of worthy men who run steam engines, and who though of limited education, desire to advance themselves; such men deserve to be encouraged. To possess the U. S. or State certificate of competency (license) is the goal of many an ambition, and this book is intended as a means to that end. It is of convenient form for ready reference and may be carried in the pocket.

SAN BENITO COAL MINES.—George B. Tolman, superintendent of large and newly discovered coal mines in the Coast Range of San Benito county, 23 miles from Firebaugh, on the Southern Pacific, is in the city. Specimens of the coal which he brought up have been tested by Prof. Hanks and reported good. The mine is in a canyon in the higher foothills of the range. A railroad is to be built to Firebaugh to connect with the Southern Pacific, so the coal can be got out.

ASSAY OFFICE.—Senator Dolph has introduced a bill for the establishment of an assay office at Portland, Or., to cost \$100,000; also, a bill for one at Baker City, Or.



DIAGRAMS SHOWING ACTION OF PARALLEL ROLLS.

Mannesmann Tube-Rolling.

With good reason may the invention of the Brothers Mannesmann, in the manufacture of pipes, be regarded as an important improvement. For pipes destined to meet severe requirements of resistance to interior pressure, it is indeed calculated to revolutionize previous practice. The method has been described by Dr. Herman Wedding before the American Institute of Mining Engineers.

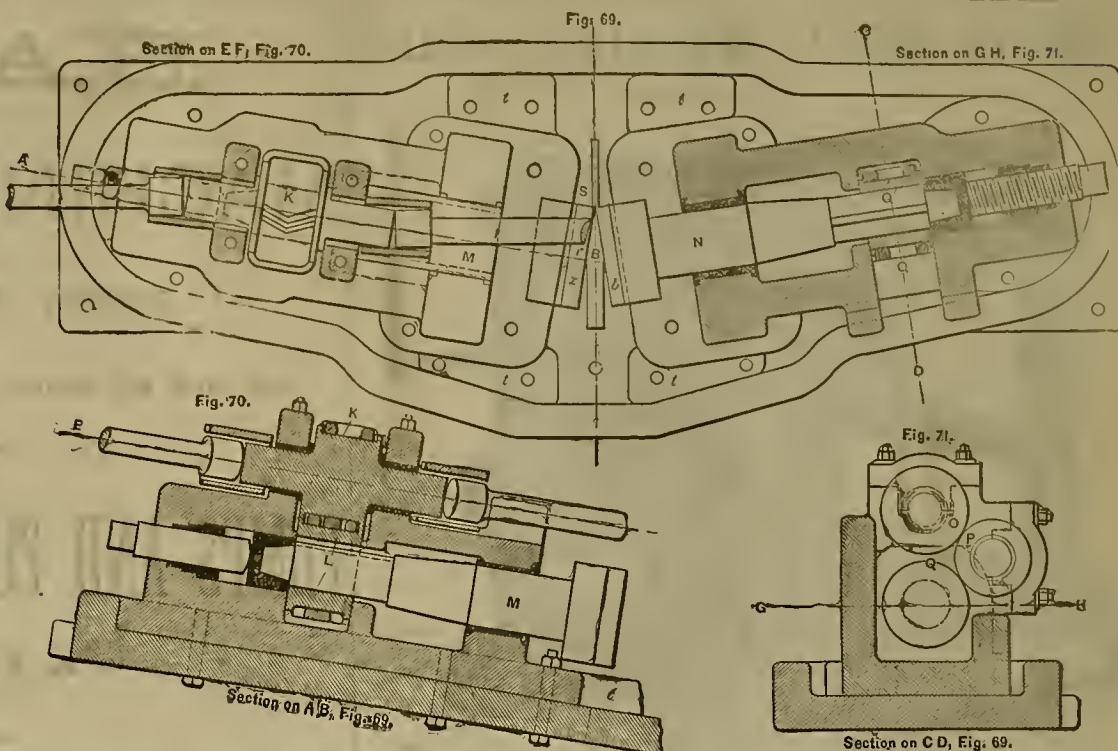
The process consists in feeding a solid, highly-heated round bar of ingot metal between rolls which, while their axes are oblique to the axis of revolution, revolve both in the same direction. The metal of the surface of the bar thus acquires an increased motion in a spiral direction, and is drawn over its core, receiving consequently the form of a pipe. It is, indeed, not practicable, without an excessive expenditure of power, to make the interior diameter of such a pipe very large. But it is sufficient that an exterior space is created, for there is no difficulty in widening it over a mandril by further operations between rolls in the form of conical disks, revolving in opposite directions. Since, in this operation also, the pipe moves spirally forward and all the parts are spirally pushed and pressed, the metal becomes still denser. It is this spiral arrangement of material which makes the Mannesmann pipes so remarkable, quite apart from the advantage they possess in presenting no lines of welding whatever. Moreover, blow-holes (which are invariably present in ingot iron) are so squeezed out spirally as to make the walls of the pipe completely impermeable. A proof of this is the retention of hydrogen for weeks in a piece of Mannesmann pipe, closed at both ends. Pipes thus made and enlarged have been successfully produced of all diameters up to 300 mm.

The Mannesmann rolls have to be driven at a speed of 300 revolutions and upward, and their relative positions to each other and to the

driving-shaft must be made adjustable, with nicest precision through a wide angle. These severe requirements in coupling the rolls to the driving-shaft were met by a special design indicated in Fig. 56. Two shafts, *a* and *b*, are each provided, at points equally distant from the center *S*, with two arms that form equal angles with *aS* and *bS*, and constitute couples which will remain in constant contact. The touching points *e*₁ and *e*₂ slide toward and away from the center *S*, each describing an ellipse during a complete revolution. In practice this movement is accomplished by setting a bronze semi-cylinder *a'* into a rounded groove on each driving-arm and making it bear with its flat surface upon a similar semi-cylinder *b'*, which is fitted into the corresponding driven-arm. The device is ingenious and works well.

Another serious obstacle which had to be overcome by special design lay in the excessive unit-stresses in the teeth of common gearing, when transmitting very high powers at high rates of speed. The form of the new Mannesmann gearing is indicated in Fig. 57. [The figures bear the same numbers as in Dr. Wedding's paper.—EDS. PRESS.] The teeth or pins are shown at *a'* *b'*; they are so shaped that one seizes the other like a fork. It is evident that when both wheels have the same number of teeth, and when their axes are parallel to each other, the forks and the blades must meet accurately, provided the teeth be always kept in a parallel position. In both wheels, this parallelism of the teeth throughout their movement is maintained by special appliances not shown. But the position of the axes of the two wheels may be swung at any angle, provided the line *AA*, Fig. 57, remains vertical. In that manner a right-angle transmission, sketched at the right side of Fig. 57, may be obtained, and a large contact surface still be preserved for the transmission of pressure.

A further necessity for this process was the required storage of power, for which the fly-wheel of ordinary construction was not suffi-



LATEST ARRANGEMENT OF MANNESMANN TUBE-ROLLING MILL.

DIAGRAMS ILLUSTRATING MANNESMANN'S PROCESS FOR ROLLING TUBES.

cient. This object was attained by making fly-wheels with a rim of wire to run very rapidly. The formation of pipes by the Mannesmann rolls is indicated by the diagrams, Figs. 58 to 63. Figs. 58 and 59 show the ordinary rolling process with parallel roll axes and opposite directions of revolutions; Fig. 60 and 61, the same, when the rolls revolve in the same direction. In Figs. 62 and 63 is shown the effect of

obliquely set rolls, operating by simple friction. In Figs. 64 and 65, the formation of pipes, under similar circumstances, but with the added effect of pressure, i. e., the squeezing forward of the several particles of metal. Figs. 66 to 68 illustrate the enlargement over a mandril by means of conical obliquely set rolls. Figs. 69, 70 and 71 show the latest arrangement in actual practice.

The Comstock Milling Case.

The suit of M. W. Fox against the Hale & Norcross directors and others, whom he charges with the illegal appropriation of over \$2,000,000 of bullion belonging to the stockholders of the company, came up again on Monday, Dec. 14th, before Judge Hebbard.

At the opening of the morning session of the court, Judge Hebbard allowed the substitution of the names of W. S. Hobart, Alvinza Hayward, John P. Jones, the Nevada Mill and Mining Co. and Francis G. Newlands, executor of the estate of William Sharon, in lieu of John Doe, Richard Roe et al., charged in the complaint as conspirators with the Hale & Norcross directors to defraud the stockholders.

As Judge Hebbard was about to make his ruling, Mr. Mesick interrupted with a suggestion. He said that in case the parties were joined, and the real names substituted for the fictitious ones, it would be a miscarriage of all that had been done up to date. Judge Hebbard replied that under Sections 473 and 474 of the Code of Civil Procedure, he had no discretion in the matter. "But in no way," he added, "does it effect the defendants already joined in this action." Mr. Wood excepted to the ruling of the court and asked to have the case go over until all the parties were made defendants.

There was a long argument between counsels relative to the matter, and Judge Hebbard brought it to a close by taking the matter under advisement until the next day. Counsel were requested to submit authorities in support of the positions taken by them as early as possible.

The next day (Tuesday) the argument on the question whether or not to allow the case to proceed before the new defendants were served with summons, was renewed. Mr. Baggett contended that the presence of the new defendants was not necessary, as before a decree was rendered their rights could be protected with a day in court. Mr. Mesick insisted that all the issues should be tried at the same time, and as against all the defendants.

Judge Hebbard said there was one general principle of equity that a case ought not to be tried piecemeal. Among other things, the action was one for an accounting. The new defendants were certainly entitled to make cross-interrogation of any new evidence which might be given, and a continuance could not injure the plaintiff. He offered the plaintiff an opportunity to withdraw the motion to include those persons not served—Messrs. Newlands and Jones.

Mr. Baggett, while recognizing inability to summon either of those gentlemen, declined to withdraw his motion, whereupon Mr. Mesick announced that he appeared for Mr. Hayward and the Nevada Mill Company, and it was also announced that Gahner, Boalt & Bishop would appear for Mr. Hobart, thus making ten attorneys to the litigation.

Judge Hebbard announced that if service was not made by Monday next upon the new defendants, he would dismiss as to them in order not to delay the case, and ordered the matter continued until Tuesday, Dec. 22d.

The California Slates.

At the last meeting of the California Academy of Sciences, Melville Attwood, Esq., exhibited some specimens of slate from the Chili Bar slate quarry, El Dorado Co., Cal. One of these specimens was to illustrate the perfect cleavage. It consisted of a number of thin sheets, split from a single block, and arranged to spread apart like a pack of cards. That, intended to show flexibility consisted of two long thin sheets, joined at the ends, which would bend and spring as if made of metal. The piece illustrating toughness was a handsome large sheet in which a handsome open-work pattern had been cut. This slate, having these characteristics, is as good as any in the world.

Mr. Attwood made a microscopic examination of these slates. The specimens examined were taken from where the cleavage in the slate was well developed, and also selected from where it was at right angles, or nearly so, to the planes of stratification. The prepared sections were cut at right angles to the cleavage, and also on the planes of cleavage. The result of the examination proved that the California slates corresponded in all essential particulars with the fine-grained slates of North Wales, containing a very large proportion of mica, not like that in stratified rocks, but in minute flakes. Their average size might be taken at 1-1000 of an inch broad and 1-2000 of an inch thick, invisible to the unaided eye, but giving a silky luster to the rock. It is possible that more modern deposits may have the same structure, but Mr. Attwood has not heard of any in Great Britain more recent than those in the Devonian rocks.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DEC. 8, 1891.

- 464,856.—FRISKET FOR HAND PRESSES—L. D. Clark, Fort Jones, Cal.
464,631.—PRUNE SQUEEZING MACHINE—L. Cunningham, Saratoga, Cal.
464,699.—RAILWAY RAIL JOINT—A. G. Edmondson, San Buenaventura, Cal.
464,603.—CUTTING APPARATUS—Hampton & Haner, John Day, Or.
464,941.—STATION INDICATOR—John Kueffer, S. F.
464,826.—OVERALLS—Isaac Kuhn, San Diego, Cal.
464,701.—PLANE ATTACHMENT—G. H. Melendy, S. F.
464,892.—TYPE-WRITING MACHINE—J. M. Prentice, S. F.
464,893.—HOSE COUPLING—Reid & Browne, Santa Ana, Cal.
464,716.—APPARATUS FOR DISCHARGING WATER—M. H. Robinson, San Diego, Cal.
464,703.—AUTOMATIC VENT FOR CASKS—Louis Stuhrt, S. F.
464,915.—DICE-BOX—Slinn & Holland, S. F.
464,698.—VENTILATING ROOMS, ETC.—W. Tarp, S. F.
464,905.—DRESSING FOR CARRIAGE TOPS—W. H. Townsin, San Jose, Cal.
464,642.—DISINTEGRATING FURNACE—Frank Walker, Los Angeles, Cal.

The following brief list by telegraph, for Dec. 15, will appear more complete on receipt of mail advices:

John T. Wahel, San Francisco, car coupling; Delbert E. Barton, San Francisco, draft for equalizing cultivator and shoe for cultivators; Conran I. Hall, San Francisco, valve; Charles Moore, Visalia, moor; William A. Russell, Los Angeles, lawn or orchard irrigator; Theophilus Tucker, Oakland, ornamenting walls or ceiling; William J. Wehner, San Francisco, horse-collar stuffing machine; J. S. Blood, Napa, Cal., washing machine.

NOR.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

INSTRUMENT FOR TAKING NAUTICAL OBSERVATIONS.—W. H. Beehler, Baltimore, Maryland. No. 464,261. Dated Dec. 1, 1891. This invention relates to an instrument for taking nautical observations, finding latitude and longitude, time, etc., either at sea or from a fixed point of observation on land. It is called a solarometer, and consists of a stand supported upon a constant level base, formed by a float within a bowl of mercury. The stand supports a horizon ring, which is thus always maintained in a level position, so that the visibility of the sea horizon is not essential. In conjunction with this is a globe having upon its surface a graphical representation of the fixed stars and different constellations. Exterior to this are equatorial declination, and azimuth rings with graduations and adjusting verniers and a zenith circle, all concentric with the globe. Upon the zenith circle are mounted object and observation tubes at an angle with each other for convenience, and an intermediate reflecting mirror by which the image of the object seen through the first tube is reflected through the second one. Azimuth tables are constructed for the principal heavenly bodies, and when an observation is to be taken, the azimuth arc is turned so that the body to be observed is seen in the tube. Various adjustments are then made to bring it to the exact center, and the exact instant is noted by a chronometer or watch rated to Greenwich apparent time. The difference between this and the local hour angle is read off on the equatorial ring between the meridian and the declination rings, and will give the longitude. The Nautical Almanac gives the lunar distance of heavenly bodies, and by comparing the lunar distance observed with that of the almanac, the exact Greenwich time is obtained at the instant of observation. An additional declination and azimuth ring are employed for this purpose. The exact direction of the vessel's head is indicated at the instant of an observation by means of a post fixed in front of the instrument in line with the keel, and having an index finger projecting over the edge of the horizon ring.

AUTOMATIC VENT FOR CASKS.—Louis Stuhrt, S. F. No. 464,703. Dated Dec. 8, 1891. This is a device which is especially applicable to casks and kegs containing lager beer and other liquids not under pressure. In drawing what are known as still liquors, or those having no carbonic acid gas which is retained in them by external pressure, it is necessary to make some sort of an opening in the upper part of the cask for the admission of air to take the place of the liquid as it is withdrawn. This is especially necessary in the case of lager beer, and in order to provide such a vent which will admit the necessary quantity of air, and at the same time protect the interior of the cask from the admission of foreign substances, and also prevent any escape of gas, which gradually escapes from the beer and is contained in the cask, the present invention has been devised.

PLANE ATTACHMENT.—Geo. H. Melendy, S. F., assignor of one-half to Bennett Bros. No. 464,701. Dated Dec. 8, 1891. This attachment for planes, such as are used by carpenters and others, consists essentially of means for adjusting and compensating the throat to the wear which takes place upon the bottom face of the plane by constant use. With this attachment, the plane can be kept in proper condition much longer. The throat of the plane can be adjusted and retained at the proper size until the plane is entirely worn out.

RAILWAY RAIL JOINT.—A. G. Edmondson, San Buenaventura. No. 464,699. Dated Dec. 8, 1891.

This is a joint for the meeting ends of rails. The object of the invention is to provide a simple and effective connection for the meeting ends of rails, wholly dispensing with the use of pins, bolts or wedges. The lower edges of the fish-plates have lugs which pass down and into slots made in the foot of the rail on each side of the web; said slots being wider than the rails are thick, whereby they enter and engage said slots readily, and being longer than the lugs, provide for the movement in the rails due to expansion and contraction. These lugs serve to connect the fish-plates with the rails. A peculiar stay or bridge fits into a groove in the fish-plate and completes the joint, which is formed without any pins or wedges. This joint is all straight work. It is easy to apply or to take apart, yet when attached will not give way or get loose unless it is broken or the tie upon which it rests is removed from under it. The upward tendency to movement of the rails simply tightens the connection. The fish-plates that are now in use can be adapted for the "bridge," which can be cut to fit the single ones, and the double ones can be cut to fit it.

DICE-BOX.—James R. Slinn, S. F., and Chas. A. Holland, N. Y. No. 464,915. Dated Dec. 8, 1891.

This shaking-box or receptacle consists of a casing having a drop-platform exposed behind a sight-aperture and a swinging throwbar operating under the back of the drop-platform. It also consists in the means for operating these parts, and in the novel construction and arrangement of the device. The object of this invention is to provide a device for the mechanical intermingling and exhibition of independent pieces, such, for example, as alphabet blocks, dice and other pieces, for the chance position and exposure of which instruction, amusement or values may be derived. Interest is lent to the observation of the mechanical operation of the device and the movements of the blocks, by reason of their sudden disappearance, in the first place, their concealment in the bottom of the casing, and their somewhat startling and rapid reappearance upon the platform.

Mining Share Market.

The monotony of the mining share market was relieved the past week by a small up move in the Comstocks. Close observers of the market, and whose opinions are generally well founded on facts, are thoroughly convinced that the pools are "milking" the public of stock, and that at no very distant day we will witness a general deal, based largely on developments in one or more of the Comstock mines. It is said to be a well known fact among miners that about five months ago instructions were given by the stock pools and confirmed by the mill rings, for no superintendent of a mine to make a strike or to develop any rich ore, and if a strike was made, to cover it up. This order was to hold good for at least seven and perhaps nine months. It was hoped that in the interim the public would be worn out, and in disgust sell their stocks at gradually sinking prices. The low prices then put out, to which stocks had to fall, have not as yet been touched. The points are now out for lower prices around the holidays, at which time they are a buy for a big movement similar to that of last spring, only on a larger scale. If such a big up movement is contemplated, what prevents stocks from being a buy now, and if prices go still lower, then buy more, but always pay cash so brokers and rings cannot freeze out those who buy. The work going on in the mines warrants much higher prices and very much higher prices will come in 1892.

Brokers who have fouled their business by aiding the mill rings to elect dummy directors, so as to loot several of the mines, are still opposed to any reformation in giving proxies. We will, at an early day in next year, give the names of brokers who still persist in giving proxies for stock not owned by them but which stand in their names as trustees.

It is given out that the reported combinations to control Belcher, Sierra Nevada and Savage have weakened. This should not surprise any one, if it be correct, for the mill rings and stock pools are opposed to any movement calculating to have the mines work according to the laws of this State, and there are too many brokers who bow the suppliant knee and are even willing at times to receive their master's lash, to bring about the desired reformatory movement so as to have dividends declared and not assessments levied by the different mining companies.

In answer to a correspondent, we will state that the bank checks reported by us in the Hale & Norcross suit were drawn in favor of Evan Williams, who testified that he paid the money to H. M. Levy. Mr. Hobart's public books were put in evidence and are now public property, it is asserted show that the money was paid to H. M. Levy et al on account of dividends for crushing Hale & Norcross ores. If Mr. Levy et al dividends aggregated about \$2000 a month, how much did the rings or "bosses" get? Under such a state of affairs, no wonder need be expressed why Levy kept levying assessments.

A correspondent has sent us a communication attacking, in no measured tone, the management of the Bodie, Bulwer and Mono mines. He asserts that they are so badly mismanaged that even the management of the Comstock mines pales before it.

There is one thing which is hard for the writer to understand, and which he cannot "even up on," to use a miners' phrase, viz.: Mines known to be controlled by Hayward & Hobart, and which they give personal attention to, pay handsome incomes to the owners or shareholders, but the Comstock mines, which report says they control, do not pay dividends but levy assessments almost continuously. The superintendent, A. C. Hamilton, of the latter mines does not even take an oath as to the correctness of his weekly reports as required by law.

Mr. Mackey testified in the Hale and Norcross suit that car sample assays and battery assays should not vary a great deal. Seeing that this is the case, why should not the Superintendent of the Con. Virginia Mining Co. give the car sample assays as well as the battery assays? The Overman Mining Co. gives both.

Reports are current that there is a pending deal in the "razor blade" (Tuscarora) stocks. The public that left the stocks alone on all former deals made money by so doing, but several persons (not insiders) who are said to have dealt in them, committed suicide, owing to heavy losses.

Mining shares opened this (Thursday) morning dull but fairly steady. It looks like a waiting market.

Brokers who, by their proxies, have aided the rings in electing dummy directors, have themselves to blame for the present condition of the mining share market.

All news from the Comstock mines that is allowed to leak out, is confirmatory of the favorable advices heretofore published in this department. The public will find that our advices are thoroughly correct, and that too before the end of 1892, notwithstanding the ring's efforts to decry them and give out, in some instances, false reports.

Our advices continue of a favorable character from the Bodie, Tuscarora and Quijota districts. Several of the Tuscarora mining companies are sending their high grade ore to Utah, where it is sold by sample, leaving, so it is said, a handsome profit to the companies. If milling companies in Utah buy ore by sample, then most assuredly car sample assays, if done by the Comstock companies, would not be such a bad thing to check the looting of mines by rings. Any company, it would seem, that desires it to be understood that they work the mines have the ore milled honestly, ought to insist on car sample assays being taken.

AN HONORABLE RECORD.

It is a singular fact that we have in our city industries older than the city itself, that have been transacting business without intermission since their establishment. This fact alone is a sufficient guarantee for honorable business dealings, and when mention is made of the house of Joseph C. Sala, successor to Mr. John Roach, manufacturer of surveying and engineering instruments, as an example of the above fact, the caption of this article will be readily appreciated by the many patrons of the house and the trade generally.

Mr. John Roach established the business in the City of New York in 1834 and moved his business to San Francisco in 1855, and was successfully engaged in the original line of manufacture until last year, when he was succeeded by Mr. Joseph C. Sala, who was connected with Mr. Roach 30 consecutive years, 20 years of the time as his practical business manager.

In 1862, Mr. Roach, under Mr. Sala's management, made the large transit for the resurvey of the city of San Francisco.

Mr. Sala is now successfully continuing the business of manufacturing and dealing in instruments of precision of the highest grades, and takes pride in maintaining the standard of excellence heretofore recognized as belonging to this establishment, and proposes from time to time to add all real improvements in mechanical construction to suit and satisfy customers. His sole endeavor will be to always maintain the reputation of this ancient house founded in New York City in 1834.

The business is located at 429 Montgomery street, up one flight, southwest corner of Sacramento, where they manufacture all kinds of surveyors' nautical and mathematical instruments. Attention is also paid to the examination of instruments for defects, and when existing, are carefully adjusted and repaired. Supplies and materials for office work constantly on hand. It is only necessary to add that the house of Joseph C. Sala is enjoying the same liberal patronage that its productions have merited in the past, with additions of new purchasers who come to them unsolicited from time to time.

HALL'S MACHINE WORKS.—Among the different mechanical industries of the city, mention should be made of Hall's Machine Works, 44 and 46 Main street. Mr. Robert Hall, the present proprietor, bought out the interests and good-will of Hall & Hedges two years ago, the original firm having been established, at that time, about eight years. While they manufacture all kinds of machinery to order, also shafting, pulleys and steam and water pipe, the specialties of Hall's Machine Works are pumps and pumping machinery. The Banner pump, which will be illustrated in the MINING AND SCIENTIFIC PRESS at an early date, takes the lead in its particular line, but the Ideal, the Smith Standard and the Flat Standard are esteemed by some mechanics among the best manufactured. Mr. Robert Hall shows an honorable business career, and Hall's Machine Works are receiving a fair share of patronage in their different lines of business.

WILLIAMS & ORTON.—Mr. G. V. Orton, 315 Mission St., is not only a practical engineer, but is also a manufacturer of machinery of all kinds from a gas engine to an anchor, being one of the firm of Williams & Orton, who make a specialty of experimental machinery. The firm has been established in the city nine years and presents a fair showing with some of the larger firms in the number, and especially the quality, of machines manufactured by them. Williams and Orton are also partners with Mr. Fillman, under the name of Fillman, Williams & Orton, who supply the trade with X X X gas engine oil. This oil is especially adapted to the heat of the gas engine.

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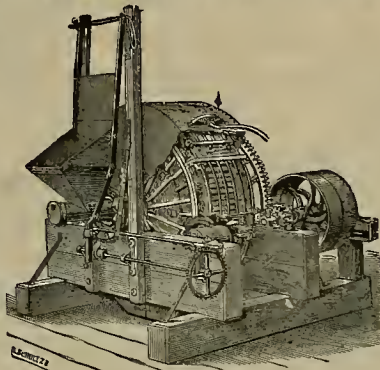
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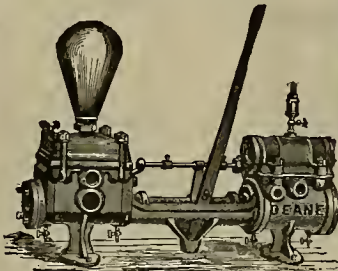
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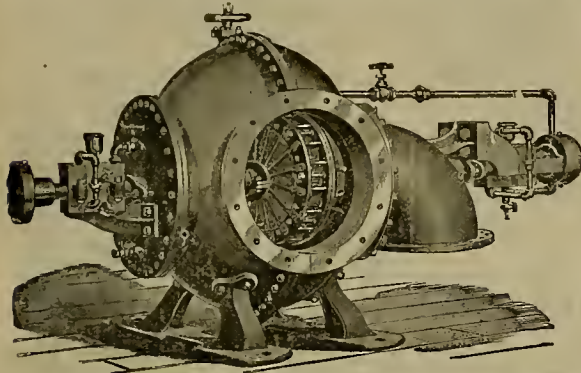
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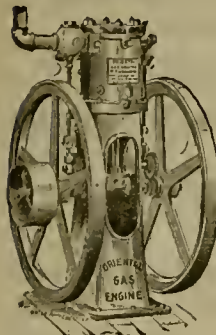
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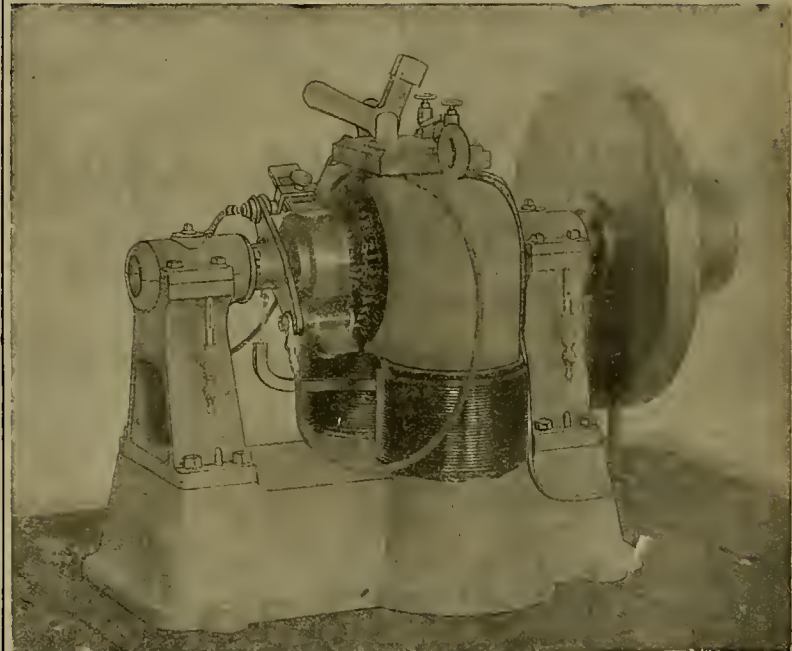
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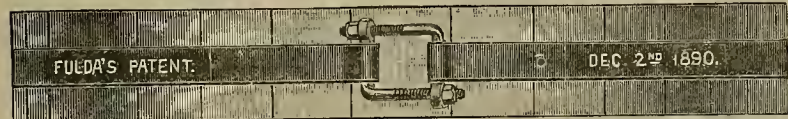
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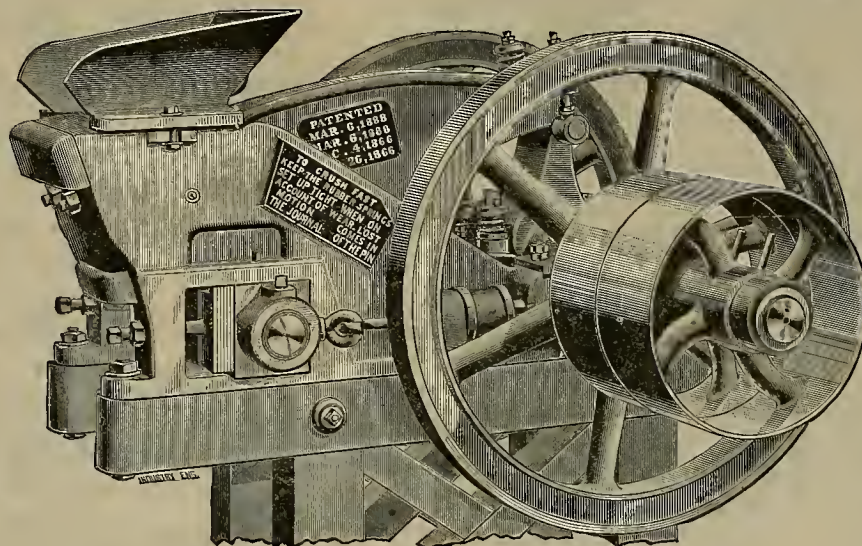
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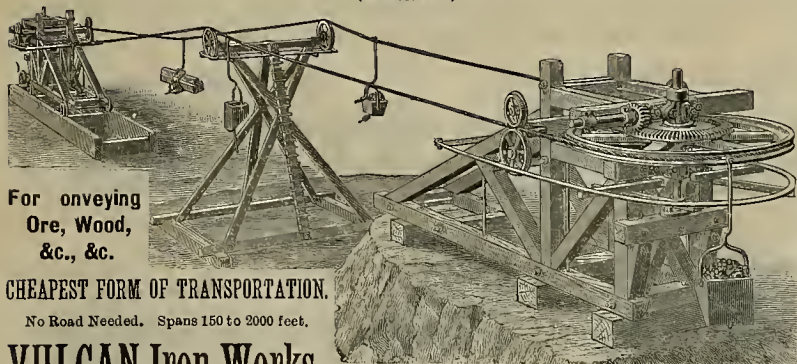
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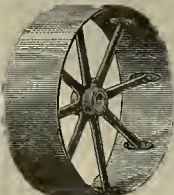
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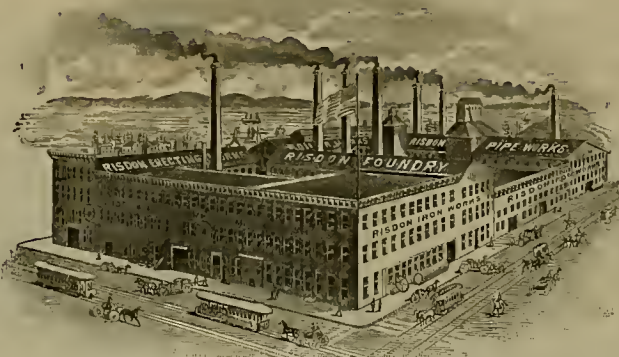
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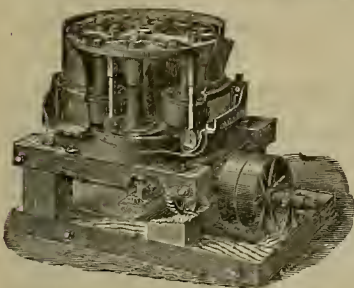
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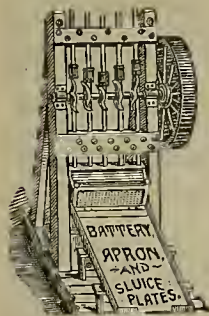
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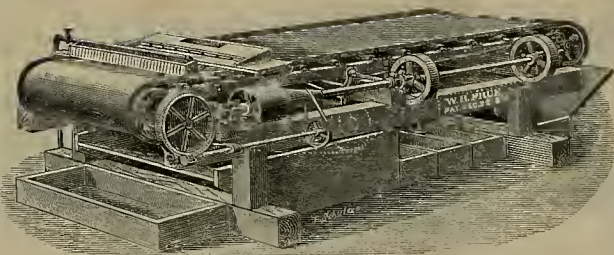
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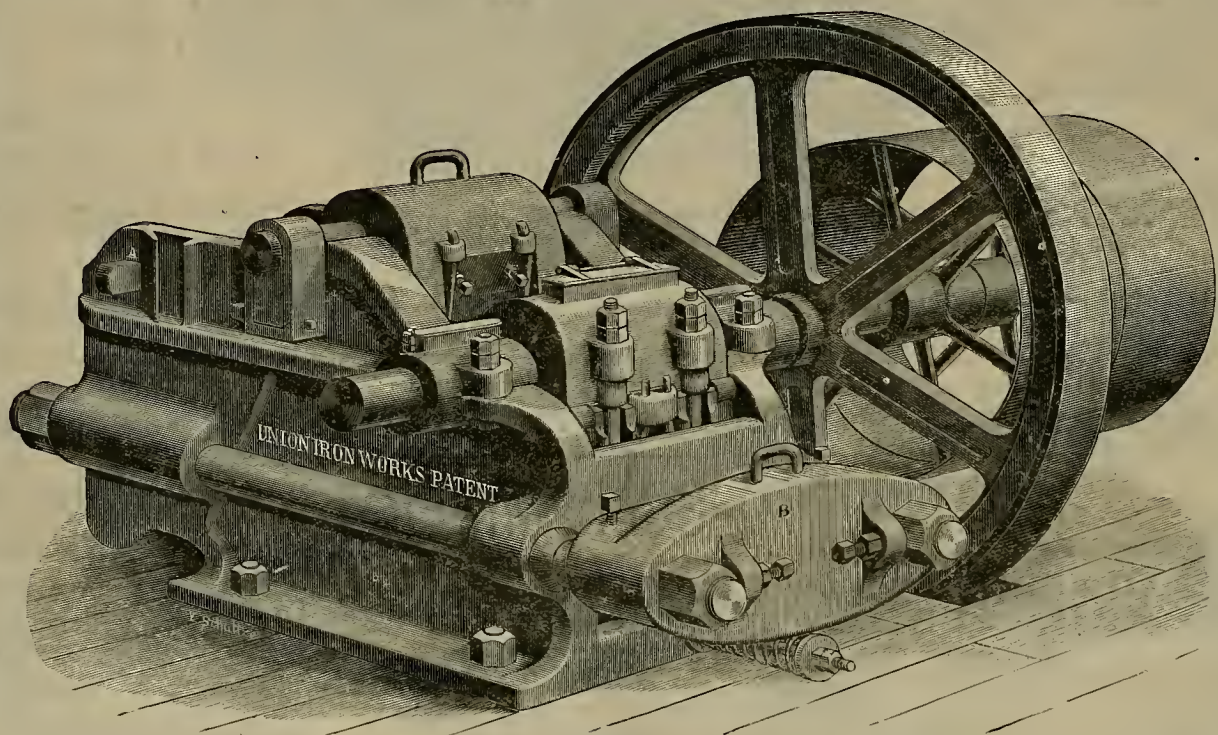
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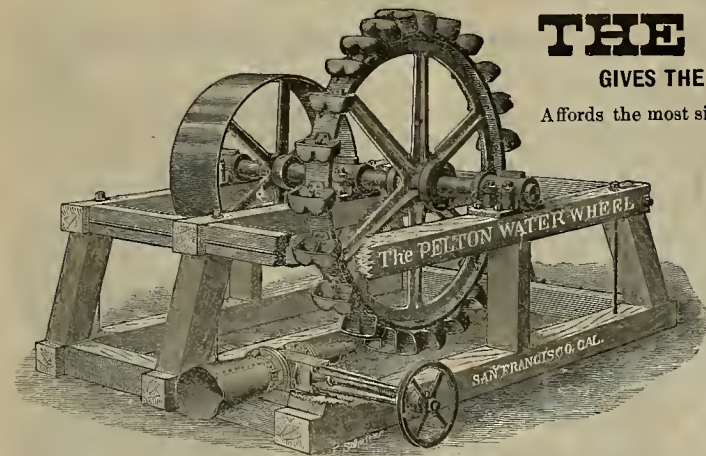
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MINING AND SCIENTIFIC PRESS.



An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXIII.—Number 26.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 26, 1891.

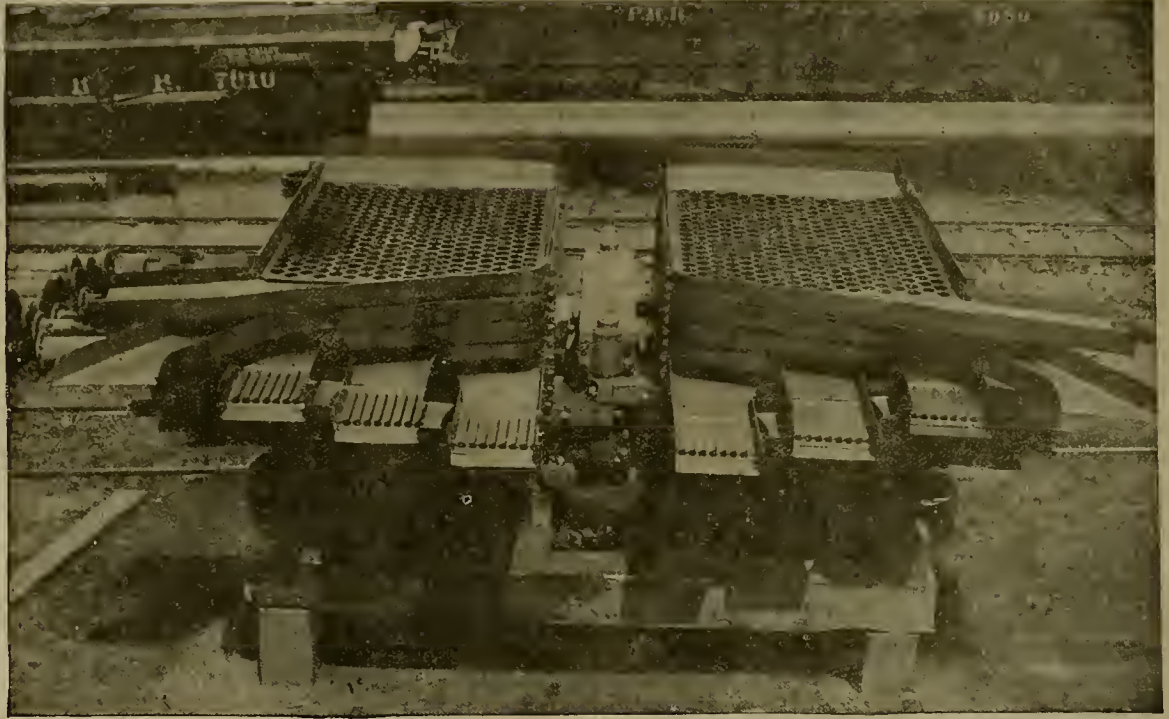
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A Large Electric Hoist.

In a supplementary paper to that read before the American Institute of Mining Engineers, Mr. H. C. Spanning of Boston shows a view of an improved 40-horse power electric hoist for mining purposes, which is reproduced herewith. In the discussion of the original paper, Mr. Spanning said: "I am unable to state with any degree of accuracy the number of electric hoists. I think that the first that I recollect were erected in the West by the Sprague Company some two years ago. That was a small application of their regular railway type of motor to a worm-shaft, and the work since that time has been mainly in the adaptation of different shapes and different designs of motors (series, shunt and compound wound), to the ordinary hoisting drum. The advance has been in securing the regulation of these hoists and getting them to work satisfactorily in the large sizes. In the matter of hoisting, it is really one of regulation and safety, and indeed does not present so difficult a problem as the haulage and pumping, because the hoist is not necessarily (at least not in all cases) subjected to constant dampness. The question of haulage seems to present greater difficulty, and several companies, the Jeffrey, the Sprague, the Thomson-Houston, and others, are working at it all the time."

Gyrating Screens for Coal.

The movable screens are among the most important parts of a breaker, such as was illustrated on the first page of the PRESS last week, from Mr. Cox's paper on the "Iron Breaker at Drifton." The approximately horizontal screen receives a gyratory motion, like the motion a molder gives to his sieve when screening his sand. This is the type of screen used in the iron breaker. Its great advantage is that the whole surface of the screen is constantly in ac-



DOUBLE GYRATING SCREEN FOR SIZING COAL AT THE MINE.

tion, while in the revolving screen of say five feet in diameter, only about eight inches of the 16 feet circumference is at any one time in action, unless the screen is overcrowded, and the revolving of the screen acts like an elevator and tends to throw the coal back into the screen.

The problem of constructing a gyrating screen, when the screen is to be large and must make a great number of sizes, is to support it in such a manner that it will gyrate easily and safely, and at the same time that it will be self-contained, so that the centrifugal force will be counterbalanced and will not shake the building. This has been done successfully.

The figure on this page is from a photograph of a double gyrating screen recently constructed which makes nine sizes of coal, and has three gyrating slate-pickers, namely, for stove, small stove and chestnut. When the screen runs at a proper speed, the inclination required to pass the coal over the surface of the screen is very slight. When first constructed, much larger inclinations were given to the screening-plates. The boxes in this case are 5 feet wide, 6 feet long, and from 2 feet to 4 feet high (inside measurements). From 4 to 8 shelves are put in, making from 5 to 9 sizes. The screen shown in plate, weighs with bed plate, 10 tons. The screening-surfaces have always circular holes, varying from $5\frac{1}{2}$ inches to one-sixteenth inch in diameter. Cast-iron is sometimes used when

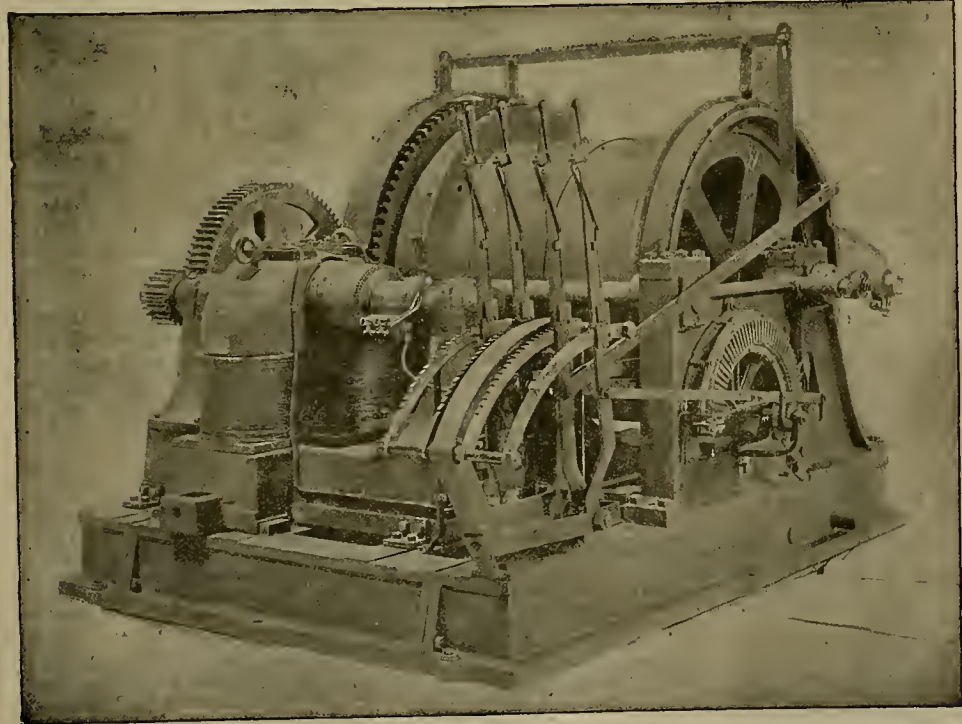
the holes are large, but punched steel is now preferred, being much lighter. Copper is used for small sizes when the water is very acid.

About 20 different sizes of holes have been used with coal to suit different circumstances. The sheet-iron lips at the lower end of the boxes are constructed to suit each particular case, so as to discharge the coal on either side of box or at any required point in front. There is no clogging of the holes, as would at first seem likely. The circular form of the holes, and the tendency of the pieces of coal to move in a small circle, cause the holes to clear themselves without difficulty.

DR. J. C. TUCKER, who came to California as one of the members of the Albany and California Mining Co. July 6th, 1849, died at his residence in Oakland on Tuesday. He has held many official medical positions in this State. In 1861 he was the originator of the bill incorporating the North Beach Railroad Co., the first street railroad built in this city. In 1863 he lived in Virginia, Nev. and was on the staff of Gov. Nye of Nevada. Dr. Tucker was a man of literary and scientific attainments and was well known in both this State and Nevada.

FOREIGN VESSELS.—According to the Commercial News of this city, the vessels in port under charter to load wheat on December 22d numbered 57 foreign vessels, having a registered tonnage of 98,882 tons, and not an American vessel under charter. At the like date, there were in the Columbia river 32 foreign vessels loading wheat, and not an American vessel in port.

A LARGE interest in the Sir Davy antimony mine, in the East range 12 miles from Mill City, Nev. has been sold by A. and J. W. French to M. S. Bonfield. The ore will be shipped to market.



FORTY-HORSE POWER ELECTRIC HOIST.

In Favor of Silver.

There was a meeting of silver advocates held at the conrthouse Sunday evening, December 6th, says the *Florence (A. T.) Enterprise*, to join issue with the entire west in making demand upon the general Government for the protection of silver. The United States court being in session large crowds from all over the Territory were present in Florence. Unanimous invitation was extended to the judiciary and members of the legal fraternity, and the hard-fisted, athletic mining element that were inured to many a vexatious hardship, and who were experts in unlocking the hidden wealth of the mountains, had ample accommodation prepared for them.

Several fine selections were played by the Florence orchestra as a prelude to the meeting and at intervals to the close. The meeting occupied one hour and 30 minutes.

The chairman, in opening the meeting, said he trusted and hoped that the hour of depression brought about by class legislation and unjust discrimination would not arrive at such a stagnation as to force us to draw a line between the East and West, and in self-justification raise the cry of our altars and our fireplaces, "God save the West."

The Committee on Resolutions made a report, which was unanimously adopted, as follows:

We, the miners and representative citizens of Pinal, Pima, Maricopa, Gila and Graham counties, of the Territory of Arizona, and being in full accord with the sentiment of our brothers of the other counties of the Territory, and, in fact, standing shoulder to shoulder with the determined, universal and expressed wish of the Pacific Coast, we now make demand upon the general Government that class legislation cease. That we rebuke in unmeasured terms the venal spirit that characterized the so-called statesmen who demonized silver for the benefit of the gold changers. That the silver industry has been almost hopelessly paralyzed, and going from worse to worse year by year. That we join our voices with the late Denver convention, likewise with the one soon to meet at El Paso, and still further on with the one to meet in San Francisco, in no uncertain tone making it mandatory and demandatory upon our law makers at Washington that silver be remonetized instead of being demonized. That free coinage be established and the discrimination between silver in favor of gold be abolished. That the Act which denies the capitalists of foreign nations to seek investment in the Territories be abrogated. We further impress upon our law makers that the people are the Government, and their wishes should be complied with, inasmuch as good government constitutes the happiness and contentment of the people. That the expressed wishes of the entire northwest, west and southwest, together with the agricultural and laboring masses of this great republic, are unanimous in their appeal that silver should be put on a parity with gold, and that there should be no discrimination as between the two metals. That this demand would be kept up unceasingly until complied with. With this spirit and sentiment then, born of a courage that will battle to the end, we send greetings to our brothers throughout the United States engaged in the same righteous crusade, that we will stand by you, fight the fight with you to the last ditch, until victory crowns our efforts, and the pathway of our progressive march will be strewn with the flowers of a triumphal consummation.

TRADE RATS.—A miner near the Senator, recently had a rather singular experience with trade rats, known also as mountain rats. As the nights were cold, the miner took his oracles to replenish his rather hard bed. Having neglected to come to town for several weeks, his supply of beans had given out, and he had to come down to a diet of straight bacon. Considerably out of humor, he started to pull his bed to pieces, one morning, and in removing the covers, was agreeably surprised to find about three pounds of beans, with a little coffee mixed, which trade rats had brought from the Senator and stored in his bed. These rats are native Americans and very different from their imported Norway cousins. They are called trade rats because they generally leave some article in exchange for what they take away. The miner states that he has never killed a trade rat; that these rodents habitually steal from one cabin and carry their plunder into an adjoining one, that on one occasion he spilled a couple of quarts of corn on the floor of his cabin, and the next morning, found the rats had stored every grain of it in a pair of saddle-bags hanging upon the wall. He also states that the rats have thick caudal appendages, about three inches in length, which they keep constantly throwing up and down, striking the floor with each downward movement with the regular and measured stroke of a musical professor marking time. They carry off plugs of tobacco, tooth brushes, combs and brushes, in fact, anything which they can manage to move.—*Prescott (Arizona) Courier*.

RECENT jetty improvements at the mouth of the Columbia river have opened the river to much larger vessels, and a much more valuable trade. The largest ship that ever sailed up the Columbia river crossed the bar and arrived at Astoria week before last. It was the four-masted ship *Alphanietan*, of 2231 tons, from Rio Janeiro in 29 days. Much larger ships from Australia, to load wheat up the river, are expected in the next few weeks.

Desert Reclamation.

Many years ago Dr. C. M. Woznorraft, a well known California pioneer, proposed a plan for the reclamation of a large area of the Colorado desert by means of a canal tapping the stream of that name, and taking much the same course followed by the water that last spring produced the Salton flood. He devoted many years in efforts to materialize this scheme, and even induced Congress to pass an act donating a large amount of land to him provided the reclamation project was carried out. But he died without having accomplished anything more than a mathematical demonstration by means of surveys of the feasibility of his plan. The fact was, Dr. Woznorraft was about 40 years ahead of the times. It was scarcely reasonable to expect anyone to undertake to reclaim any part of the desert so long as this State possessed so vast an area of arable land awaiting settlement under far more favorable conditions.

But the time has come when enterprises of a similar character may be inaugurated with a reasonable certainty that they may be carried to successful completion. Such an enterprise has now been projected near Yuma which upon its face seems practicable, and which has for its object the reclamation of a vast body of desert land lying on the easterly banks of the Colorado. There is a place in the river about 28 miles above Yuma where it is possible to tap that stream with a canal which could irrigate upward of 175,000 acres of land, which, though at present unproductive, is fertile, and needs only the aid of water to become highly fruitful. Below the Arizona line, in Mexico, the same canal might be made to supply fully a million acres. But whether any international arrangement could be reached for such a purpose is somewhat doubtful. There is no doubt, however, about the feasibility of irrigating a large body of American land and the grades are such that the canal need not be extraordinarily expensive.

As the Colorado is a navigable river it is proposed to ask Congress for authority to put in a dam and a lock at the head of the canal, so that navigation shall not be interfered with, but on the contrary, it is claimed, benefited.

There is certainly nothing intrinsically impossible in such a plan as this, and if it can be carried out it will be of the greatest benefit to Arizona and help that territory a long way on its journey toward statehood.

The President on Rural Mail Delivery.

We have already alluded to Secretary Wanamaker's position with reference to extending the free delivery of mail matter to rural districts and the benefits which would accrue therefrom. It is encouraging to note that President Harrison holds similar views, and in his message last week at the opening of the present session of Congress, the following paragraph occurs:

"An appropriation was given by the last Congress for the purpose of making some experiments in free delivery in the smaller cities and towns. The results of these experiments have been so satisfactory that the Postmaster-General recommends, and I concur in the recommendation, that the free-delivery system be at once extended to towns of 5000 population. His discussion of the inadequate facilities extended under our present system to rural communities, and his suggestions, with a view to give these communities a fuller participation in the benefits of the postal service, are worthy your careful consideration. It is not just that the farmer who receives his mail at the neighboring town should not only be compelled to send to the postoffice for it, but to pay a considerable rent for a box in which to place it, or wait his turn at a general delivery window, while the city resident has his mail brought to his door. It is stated that over 54,000 neighborhood are under the present system receiving mail at postoffices where money orders and postal notes are not issued. The extension of this system to these communities is especially desirable, as the patrons of such offices are not possessed of the other facilities offered in more populous communities for the transmission of small sums of money. I have, in a message to the preceding Congress, expressed my views as to a modified use of the telegraph in connection with the States in view."

These are all progressive ideas and will tend to place rural communities on a better plane of advantage and comfort. They should prevail.

A COAL MINE ROW.—Salt has been brought to remove William L. Higgins, A. S. Hubbard, Charles B. Adams, William P. Howland and George B. Tolman from their positions as directors of the George Oscar Coal Mining Company, and to declare null and void a resolution of the defendants, assigning to each of themselves 20,000 shares of stock in the corporation without consideration. Judgment is also asked that the defendants deliver up other shares of stock obtained in a similar unlawful manner, and that they be compelled to surrender possession of all books and property of the corporation under their control. The plaintiffs in the suit are the following stockholders: P. H. Posner, A. E. Brilliant, Henry Fritz, Charles Lalner, B. C. Austin, Mrs. Harriet Austin, N. Frost, Minnie Jellinek, Henry P. Crewe, W. H. Wolkman and Charles A. Peterson.

Water Hints for Desert Prospectors.

Attention is likely to be turned to desert mining by the success realized thus far on the San Bernardino locations of Lum Gray and others. Lack of water has always been a serious obstacle to such enterprises. Many have died for want of some rule by which to secure the life-sustaining beverage, which was, if they had only known it, very near at hand.

Veteran George Fowler, now in town, has spent 25 years in the various deserts each side of the Colorado river and in Nevada. Over 12 years ago, he went 26 miles west of that river to bury a couple of men whom thirst had gathered in. Two Indians guided him. The victims' wooden water kegs had fallen to pieces with dryness. Mr. Fowler then learned to use only metal canteens on such expeditions. He met the Government exploring party in Death valley last winter. Their tanks were covered with asbestos, which kept the temperature cool. To escape sandstorms, by the way, they crawled under rubber refuges.

Water, however, is most likely to be found in the washes, no matter how dry. Mr. Fowler noticed that quails would scratch just above where headrock peeped out from these washes, and found what moisture they needed. Following their plan, he has often sunk from four to eight feet and obtained ample drinking supplies. The water must be there. It sinks to headrock, and when the latter rises to surface, or near it, it forms a natural dam and an underground reservoir is waiting there to be tapped.

Mr. Fowler expects to prospect this winter in Death valley and other nasty portions of Southern California's deserts. Rains then may help him some, but the quail plan of finding water can be depended upon.—*Phoenix (A. T.) Herald*.

Mining Bureau Museum.

Recent additions to the collection of the California State Mining Bureau are as follows:

Tin ore, Redruth, Cornwall, England, from T. H. Simmons.

Vivianite (phosphate of iron), Maple Creek, Humboldt Co., Cal.

A large number of fossils from Humboldt Co., Cal.

Gold quartz and crystallized gold, Bonanza mine, Linn Co., Oregon; A. Halvorsen.

Aragonite, Mt. Downey, Orange Co., Cal.; Geo. F. Hoyt.

Vesuvianite, Santa Cruz Mountains, Cal.

Astrophyllite, large and handsome specimen, El Paso Co., Colorado; J. Z. Davis.

Alexandrite from Fakovja, Siberia.

Agulairite, Guanajuato, Mexico.

Amalgam (crystal), Moschellandsberg.

Arfvedsonite, El Paso Co., Colorado.

Bastnaesite, West Cheyenne canyon, Colorado.

Boracite (crystal), Luneberg, Hanover.

Polybasite, Lawson, Colorado.

Staphaolite, Freiberg, Saxony.

Titania, Tilly Foster mine, New York.

Tridymite, Cerro San Cristobal, Mexico.

Hessite, Lulabua, Transylvania.

Magnetite, of excellent quality, Pope Valley, Napa Co., Cal.; J. C. Sullinger.

First U. S. cent, the "Franklin" or "Ring" cent; Horatio N. Russ.

Rubellite (red tourmaline), San Diego, Cal.

Black and green tourmaline, Graphic granite and Lepidolite in several varieties from San Diego, Cal.

Rich tin ore and inclosing rock of the vein, Temescal mines, Cal., from the company.

THE ALIEN LAW.—The passage of the Alien law by Congress, which applies only to Territories, has had the effect of keeping millions of dollars out of Arizona since its passage. Under the Alien law, foreigners cannot purchase mining properties in any of our Territories, and this capital has been kept away. No less than 7 important sales which would have aggregated over a million and a half dollars to Southern Arizona, have been defeated within the last two years simply because an English and French syndicate could not receive a title to the mines in Arizona. When Arizona becomes a State, this condition of things will pass away; and while the miner will be the greatest beneficiary, the Territory at large will be largely benefited by the increased amount of taxable property, and the employment of labor as well as the production of bullion. No class of people will receive greater benefits from Statehood than the miners and prospectors, hence it is plain that they will all vote for the Constitution and Statehood.—*Tucson Star*.

TIMBER LANDS.—The laws of the land permit the use of timber in certain States and Territories for mining and domestic purposes, but the authorities at Washington never tire of imposing onerous conditions on the people for the enjoyment of a legal right. As for instance: Commissioner Carter of the General Land Office has issued a form of permit to be granted persons applying to cut timber from public lands. Among the stipulations is one forbidding the cutting of more than 50 per cent of timber of that class growing on an acre. A monthly statement under oath is required, giving description of the tracts from which the timber is taken. No trees shall be cut or removed of less than a specified number of inches in diameter, except for a needed roadway through the timber. The person cutting the timber is required to cut, remove, burn or otherwise dispose of the tops and brush of the trees, etc., to prevent forest fires, and will be held liable in damages for the spread of fires attributable to his neglect.

The Water Front of San Francisco.

The Sea Wall, Belt Railroad and Grain Warehouses.

The water front of the city of San Francisco does not belong to the city of San Francisco at all. It belongs to the State—the people of California—and the city spends no money on it and receives no money from it. The whole water front is under charge of a Board of State Harbor Commissioners, who build the sea wall and wharves, receive and spend the income from tolls, wharfage, rents, etc., and conduct the business on behalf of the people of the whole State. These facts should be borne in mind by people in the interior, many of whom have an idea that the city itself charges excessive tolls on commerce and reaps all the benefit. San Francisco itself does not own a single wharf, warehouse or dock, and in fact no private individuals own any water front landing places outside the line of the sea wall. The whole thing is State property.

As far back as 1851, when improvements began on the water front, it was seen that a retaining wall around the city front and the filling in of the lots and streets adjacent would be necessary to obviate the constant cost of repairs and allow the erection of a better class of buildings. The teredo destroyed the piles and hoof and wheel made short work of the street planking.

The subject began to be discussed and made its appearance in the Legislature in various ways. It assumed definite shape, however, in 1860, in the bill to grant the right to construct a bulkhead (or sea wall) to a corporation known as the San Francisco Dock and Wharf Co. This measure was advocated and resisted with ability and persistence on both sides, and as will be remembered, after passing, was wisely killed by an executive veto. The contest, however, settled two points, viz., the necessity of the sea wall, and that it should be constructed by the State and not by private parties. In 1863, the Act was passed creating the Board of State Harbor Commissioners and instructing them to begin the construction of the sea wall. A plan was reported in 1865, and contracts let for two sections in 1867. Since then the work of building the sea wall has gone steadily on, until now, it is completed from the Market street ferries as far around as the old Meigs' wharf at the foot of Powell street, and an additional section under construction to beyond Taylor street. The map which is printed on the opposite page will show the extent of the work completed.

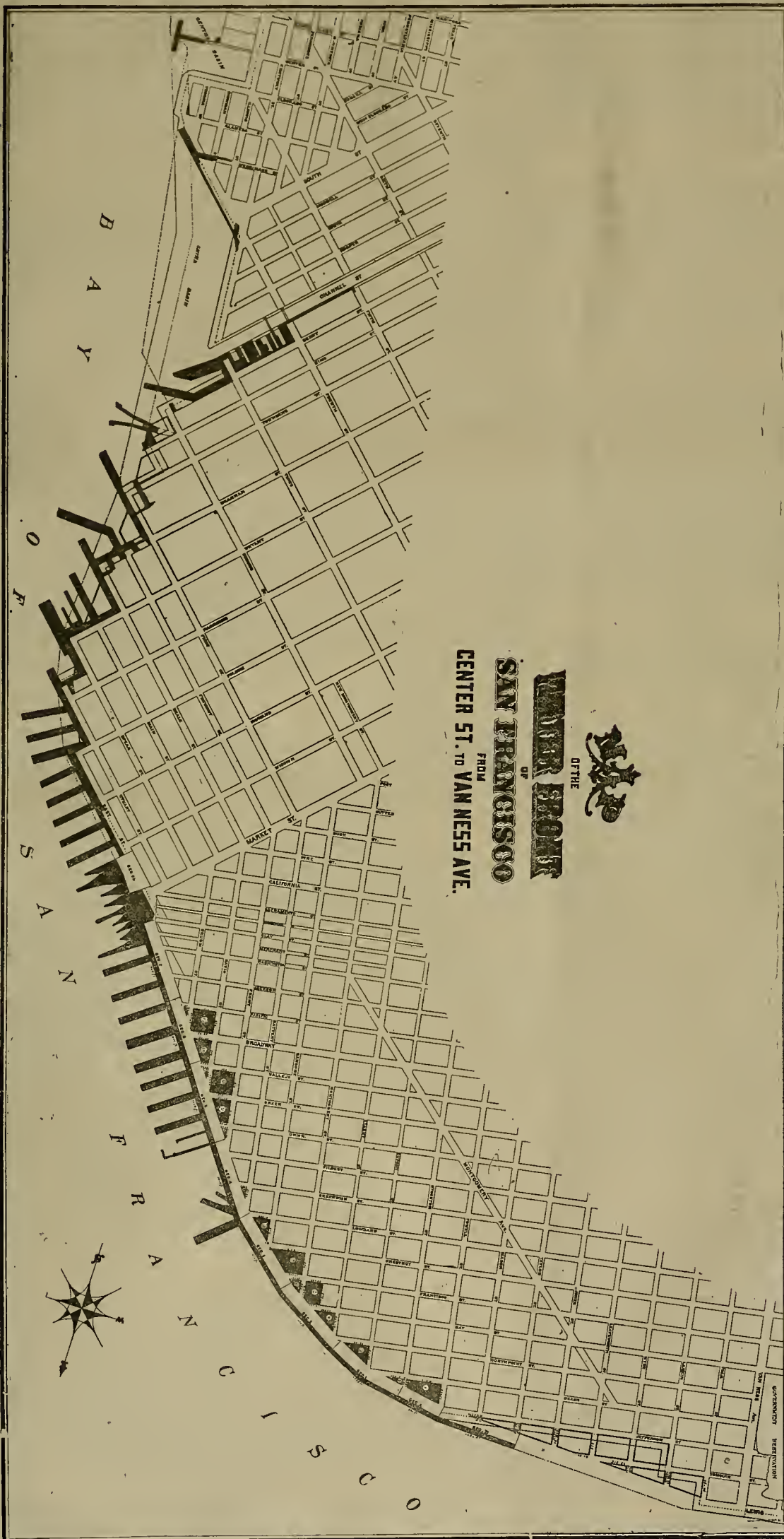
In the early days wharves were built without any general plan, and the zigzag lines of those wharves had to be straightened by the engineers of the Commission. A line was fixed for the sea wall in a general curve entirely around the city front, parallel to the movement of tides. As fast as a section is completed, wharves are extended from this wall, at which ships may lie.

The sea wall itself, is simply a rip-rap embankment of stone, which is thrown loosely into a channel dredged about 60 feet wide and 20 feet deep, and carried up with a proper slope to the official grade. It is a retaining wall, against which the water front streets and lots may be solidly filled in. The original plan of a concrete facing was entirely abandoned as of no practical use and involving great expense. The only exception to the system of construction described, is immediately at the foot of Market street, where the ferry landings are. Here they built a solid wall of concrete, now partly completed, and filled in behind that with sand, a foundation first being prepared by driving piles close together and placing upon these heavy planking. This was done inside of the concrete wall, and in front of the space thus prepared the new ferry buildings are to be placed.

As the sections of the sea wall proper are completed, the space inside is filled in and brought up to grade. The streets are then laid out and paved with basalt blocks. A fine, wide thoroughfare has been completed and paved from Foley street to the foot of Stockton at North Beach, and this will be eventually continued entirely around the city front to Mission bay at the south and Van Ness avenue at the north.

Outside of the sea wall, and at right angles with it, extend the system of piers or wharves. These reach out to an established "pier-head line" generally parallel with the sea wall, arranged so as to secure the full sweep of the tidal currents. The dockage room for shipping

MAP OF THE WATER FRONT OF SAN FRANCISCO.



is between these wharves. As will be seen by the map, no right angle piers have been thus far built beyond that at Lombard street; and along the wall north of that are the great wheat warehouses, of which more will be said further on.

The work on the section at the foot of Market street is, as has been stated, different from that on other portions of the water front. The sea wall as built there, will serve as the foundation for the west front of a large passenger depot, designed to be about 800 feet long and 150 feet wide. The east front will rest on heavy concrete piers, about 40 feet apart. The building is designed to accommodate the passenger traffic reaching the foot of Market street. It will be several stories high, with a central portion one story higher. The second story will be reached by a steel bridge over East street and extending to the south side of Sacramento street, and connected directly with the upper decks of the ferry steamers. The principal materials of construction will be iron, steel and glass. The building, with its bridge and approaches is estimated to cost about \$504,000.

In order to put up these extensive ferry buildings, and at the same time continue the necessary work along other parts of the city front, the Commissioners found they would have to anticipate their income, (which is contrary to law) unless the State made a special appropriation. As a special appropriation would naturally increase taxes, and this was not desired, the last Legislature was asked to let the board issue bonds for \$600,000 for the construction of the new depot. This proposition will, therefore, be submitted to the people at the next general election.

Since the laws creating the Board of Harbor Commissioners, and defining its duties and responsibilities, were passed, additional duties have been imposed. The concentration of a vast local and transcontinental passenger traffic at the foot of Market street, and the need of building a belt railroad around the State's water front properties, have imposed obligations upon the board beyond the limits of their present revenues. There can be no doubt of the advantages to the State at large of the past policy of the board regarding the absolute ownership and control by the State of all the water front property, and the structures thereon. No person, nor corporation, should own any structure whatever upon the State property, nor should such structure, when built by the State, be under the exclusive control of any person or corporation.

Although the time is at hand when the public need for suitable passenger accommodations at the foot of Market street is great, and our commercial necessities demand the most complete facilities for rapid handling of freights, no step should be taken which would, in any way, tend to impair the absolute control by the State of the vast interests of the water front. The direct revenues of the board are sufficient, when wisely expended for the maintenance and extension of the water front and sea wall, as originally provided for by law, but not for meeting the additional burdens above mentioned. It is believed that these burdens may be borne without the addition of one dollar taxation upon the citizens of the State.

The issuance of these bonds will not bring taxation on the people at large in any way. They will be paid out of the income of the Commission, which is about \$600,000 a year. This income will be greatly increased when the entire belt road is completed. The railroad companies pay for the privilege of using this belt railroad five cents per ton on all freight passing over it, and 50 cents per car, besides the rent for the depot room or freight sheds. At the new ferry landings the railroad companies pay \$600 per month for each steamer slip (and there are eight slips), which includes the use of the present ferry passenger depots. Since the Southern Pacific Company uses most of the passenger depot, many people suppose it is to be built for their benefit alone, but this is not the case. They must pay for its use, and these payments go toward paying for the improvements. The people are not taxed for it at all, nor will they be. Every person who comes to or goes from San Francisco uses these ferries, and the new buildings will be a very great convenience.

It should be here stated that the State has now reclaimed from the bay, by the construction of the seawall already built, over 30 fifty-vara lots worth at least \$1,500,000. By the extension of the seawall westwardly to Van Ness avenue at a cost of about \$440,000, an equally large and valuable area will be reclaimed. The grading of these lots will cost about \$200,000, so that by this extension (on which work is now going on), at a gross cost of \$640,000, the State will be in possession of additional property of a minimum value of \$1,500,000, as well as that now reclaimed. There is no need of funds for carrying out this work, as its prosecution comes under the regular expenditures of the San Francisco Harbor Improvement Fund, as provided by law. In a few years the State lots will aggregate over 60 fifty-vara lots, and a value of at least \$3,000,000. These lots are shaded on the map so their location can be understood. The lots are used for lumber and car yards, freight depots, coal platforms, steamer repairs and stores, offices, etc., by the Commissioners.

One of the most important features in connection with the water front is the belt railroad, of which the first section has recently been put in operation. It will ultimately be

(Continued on page 421.)

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NEW LINDEN.—Amador Ledger, Dec. 19: We regret to state that operations at this claim, near Plymouth, have come to a standstill. The owners, Messrs. Ballard and Martin of San Francisco, have spent a fortune in a thorough and systematic prospecting. It is estimated that they spent, from beginning to close, over a quarter of a million dollars. The hoisting machinery and 40-stamp mill are equal to any in the State. They have searched the ground in all directions to the depth of over 1000 feet, only to meet with disappointment. Some good ore was discovered, but not in paying quantities. The explorations have extended over a period of five or six years. They have now come to the conclusion to quit entirely. Underground work has been suspended, and the machinery is to be taken out and removed to other mines in which the owners are interested.

MISCELLANEOUS.—The ten stamps of the Amador Queen mill were expected to commence the work of crushing yesterday. The ore is known to be low grade, and a test crushing will demonstrate whether it can be satisfactorily worked.

ACCIDENT.—J. W. Smith was killed at the Kennedy mine last Sunday by a timber falling upon him and knocking him 500 feet down the south shaft.

OLETA.—Our mining enterprise is running along very nicely. The sound of the whistle makes one feel like having new life. We hear they have struck gravel in the new shaft, which prospects well. We challenge any company to put a more complete plant in the way of machinery than Messrs. Davis and Campbell.

WOODBURY CONCENTRATORS.—Amador Dispatch, Dec. 19: Geo. E. Woodbury of San Francisco, inventor of the improved concentrators hearing his name, was in Jackson this week looking after some of his machines which are being put up in the Amador Queen mill in Hunt's gulch, which is about ready to again commence operations.

Nevada.

THE CENTENNIAL.—Transcript, Dec. 17: At the Centennial drift mine, the upraise above the main tunnel toward the surface for air and water purposes is now up 125 feet; face in hard, dry cemented ground. Main tunnel continued south beyond foot of the upraise, 45 feet; and another upraise for the gravel bed exploration will be made shortly.

MINE BONDED.—Grass Valley Telegraph, Dec. 17: Wednesday, a working bond was given to Col. W. J. Sutherland and others on the Golden Treasure mining claim. The Golden Treasure is what has been known as the Sauvee ground, and is in near the Empire, W. Y. O. D. and other famous properties. It has a fine hoisting and pumping plant on it, and the company that has secured the bond is a strong one, and will begin operations early in January.

GRANITEVILLE DISTRICT.—Henry Cochran and his partner evidently have a valuable piece of property in the Hooser quartz claim, which is situated four miles east of Graniteville, and near Bowman dam. The tunnel is in 300 feet on a ledge that averages about four feet in thickness. A crushing was made recently at the Baltic mine, and paid so well that the owners propose to build a mill next spring.

DIAMOND CREEK DISTRICT.—O. M. Easton has bought the Chase & Saunders and Forest or Dill gravel claims on Diamond creek, about two miles above where that stream joins the South Yuba river. The tunnel, 180 feet long, which Curtley ran in the '60s, and which he abandoned just after he had passed through the rimrock and into the channel, has been cleaned out 100 feet by Mr. Eastman, who finds it so badly caved beyond that point that he will have to make a new one from there on. The claim has been named El Monte by the new owner, who soon expects to have the first systematically worked and paying drift mine in that part of the county. Adjoining the El Monte on the southeast, Fritz Meister and J. S. Spring have a claim in which they have since last summer run a tunnel 100 feet. They will soon make an upraise, as they think they are under the channel. Diamond creek, which is in Washington township, paid fabulously in early days as a placer-mining region, and the lead which the above gentlemen are now prospecting for has given good returns to various prospectors. Whether or not it will pay for drifting remains to be seen.

NEVADA CITY.—Transcript, Dec. 19: The new hoisting and pumping machinery for the Odin drift mine is being set up, and will be running about Christmas Day or shortly after. The putting in of the new pumps at the Providence mine is almost completed, and when they are started, it will take but a short time to get out what little water is accumulating while the change is being made. Capt. John A. Rapp has one of the best prospects not only in this immediate vicinity, but in the county. He is sinking on the Stiles ledge from the east side of Roger Williams' ravine, and at a point 700 feet north of where considerable work was done many years ago in an effort to develop the same ledge. The incline is down 35 feet, shows ore all the way, and in the bottom the formation is 3 1/2 feet thick. The quartz presents a very lively appearance, is heavy with sulphurets and carries some free gold. It will, in the opinion of experienced miners, pay \$30 or more a ton. Robert Hughes and Morris Green this year located a claim on Rush creek, half a mile west of the Green ranch. They washed off 40 feet of soil and uncovered the ledge, but the ore contained very little gold. They then sank. At a depth of 40 feet pay came in. They now have their incline down 70 feet and it shows a foot and a half ledge that will, perhaps, pay \$300 a ton. Water is coming in so fast that they must get heavier pumps.

MOONEY FLAT DISTRICT.—The old Wheaton mine, which is being operated by C. F. Ayer, is working about the usual force of men, with good prospects. The persons who leased the old Ayer mine in Mooney Flat are making quite a fortune. Last week they retorted 23 1/2 ounces of pure gold for one week's run. This is a very large cleanup for one week, considering the fact that there are only eight men working.

CANYON CREEK DISTRICT.—There is at the Narrow Gauge depot here, a cannon ball quartz crusher of English invention, which is en route from San Francisco to the Waldeck mine on Canyon creek. There is one like it in Auburn, where it is giving satisfaction. They are quite common in South Africa. The machine has a capacity of three tons a day. Fritz Meister, the owner of the Waldeck, and who also has a bond from George G. Allan on the Canyon Creek claim, which is a parallel ledge, has a lot of quartz out, and good judges say it will average at least \$50 a ton. Samples of it assayed at Salt Lake gave a return of \$700 a ton. The formation is so large and so handily worked, if it goes \$50 a ton right along, Mr. Meister will make a fortune out of it.

Placer.

BONDED.—Placer Herald, Dec. 19: J. M. Bryan, an old miner of these parts, after operating in Mexico and other mining regions, returned here a week ago and has bonded the Conrad mine on Duncan Hill. He has put on some men, sinking at the same point where Thorpe and Kennicott a few years ago took out \$2500 at a depth of 15 feet. Those who know the lead think Bryan will make it pay.

Plumas.

THE CONSIGNEE.—Plumas Co. Bulletin, Dec. 17: Pit Trayner, Supt. of the Consignee mine, above Cromberg, was in Quincy Monday. From him we learn that work has been suspended temporarily on the Consignee in consequence of the freezing of the water which furnishes the power for the "blower." As soon as the weather moderates, work on the property will be resumed. The tunnel is now into the mountain about 200 feet. It will be pushed ahead to bottom the channel. A former tunnel run by the company proved to be too high. The stockholders of the company live in Pittsburgh, Pa. They have faith in the development of a big mine where they are now operating, and miners acquainted with that part of Plumas believe they will be successful. Breaks from the channel now sought have yielded large quantities of gold. Mr. Trayner is an experienced miner and a good manager. He will push work actively during the coming season. Chas. Mayn and R. Burnett continue work on their mine, about two miles from the Consignee. They are driving the tunnel ahead and hope to reach the channel soon. John Porter and Wat Bell have leased a small part of the mine owned by Thomas & Thompson, near Quincy, and they are now working it with good results. Stratton & Hubbard are reported to have done well the past season in their mine at the head of Poplar creek.

San Diego.

RUBY.—Julian Sentinel, Dec. 19: A new car arrived for the Ruby mine this week, and work can now be pushed much faster. Things are beginning to move at the Wilcox mine under the new management. W. D. Chambers is a hustler, and under his supervision these mines promise to develop into paying properties.

Sierra.

SIERRA CITY.—Mt. Messenger, Dec. 19: Salines & Mercer Co. are pushing their tunnel ahead and stopping out rock for their mill. Cleveland Co. employs 15 men. Its 12-stamp mill is running and ore said to be paying well. Water has frozen and ditch recently broke at the Marguerite quartz mine, causing temporary stoppage of work. Ten stamps are running at the Colombo, where good-paying rock is being milled and 18 men are employed. A full crew is working at the Young America, and the mill is crushing ore. The prospect is very favorable for a prosperous future. Wm. Tell Co. has completed its 300-foot contract, and the ledge widening. Another of 50 feet has been let. Four men, two shifts, are working. Butte Saddle G. M. Co. is pushing its main tunnel ahead for the second pay chute that may be reached at most any time, according to the surface croppings. Chips Co. was working 20 men before the late cold snap, but not so many since on account of scarcity of water. Its 12-stamp mill is running. A full crew is on the pay-roll. The Chinese who bonded the 1001 drift mine for five years have obtained a good prospect. Lead is over 100 feet wide. The claim will be put in thorough working order at an expense of about \$5000. A flume costing \$6000 is to be laid to the head of Deer Creek, six miles from their diggings. Mountaineer Co. is running its tunnel for a second ore chute. Six men are busy. Its ten-stamp mill is running. Far as chimney has been followed (75 feet), sulphurets have been black, very similar to those of the Young America. Two hundred feet more of tunnel will bring face under the second pay chute. Sierra Buttes Co. has struck another pay chute in No. 2 tunnel, new ground, and its ten-stamp mill, up on the side of the mountain, at No. 2, is steadily crushing ore. If this chimney continues going down, quartz therefrom will be eventually carried out of Nos. 8 and 9 tunnels to be worked in No. 9 mill, where 40 stamps remain in view of probable future operations. Mr. Thomas has charge of the property, under whose efficient management affairs are favorably progressing. No. 3 tunnel at the Mountain mine is being pushed ahead, and a large chute of pay ore has been discovered averaging from 10 to 30 feet in width. Messrs. Flint and Parker have the contract for running No. 3 tunnel through the mountain toward the Young America. Soon as spring opens, a big crew of men will be put on to run the 40-stamp mill. Sierra City people are very much rejoiced over the favorable outlook for this promising mining property. Jas. Hagerty, general manager, sees that work is energetically and advantageously prosecuted during the temporary absence of Geo. M. Pinney in Mexico. Ten stamps are crushing ore at the Phoenix. Rock averages \$8 a ton. Twenty men are employed. Main tunnel is 700 feet long. One chimney is being worked, followed for 600 feet. Seventeen tons of ore are crushed daily. Emile Shultz, architect of the Phoenix mill, ably assisted by J. H. Henderson, merits and receives much credit for the workmanlike and durable manner in which it has been constructed. Thos. Brennan is secretary and treasurer of the Phoenix mine. Its sole owner, our well-known and esteemed supervisor A. C. Busch, appears happy and contented over the recent monthly cleanup of \$4000.

Shasta.

A PROSPECT.—Redding Free Press, Dec. 19: D. H. Castle, who has been prospecting a mine in the French Gulch district, about one mile from the Gladstone, came down this week, there being too

much snow in that section. He brought with him a bag full of sample ore which makes ones' eyes glisten to look at. The ore shows rich in gold and also contains copper. Castle and his partner, McKee, have run in on the ledge 60 feet and have taken out some 20 tons of ore. They have also constructed a road nearly to the mine; about three days' work will complete it. The rock that he showed us would pay handsomely with a hand mortar.

Tuolumne.

BUCHANAN.—Union Democrat, Dec. 19: The Buchanan mine has discharged a number of men who were employed in the old shaft. The men working in the new shaft, which is situated on the old Francisco claim, will be retained; but it is not probable that many men will be employed at the mine during this winter. Heretofore, a full force was required winter and summer to run this well-known mine, but a new departure has been resolved upon. The water has been turned on in the great mining ditch running through our eastern camps, and mills which have had a period of enforced idleness are preparing to resume operations. Wilbur Long came in from the New Albany mine last Sunday. Wilbur reports four men at work in the mine. The ten-stamp mill is kept running during the day, and is fed with ore from the 100-foot level, which is looking well. The main shaft of the mine has been sunk to the depth of 800 feet. James Gloster has uncovered a fine-looking vein at Spring Gulch. It is four feet wide and yields a fine prospect. Spring Gulch has been an excellent mining neighborhood, and as Jim is one of the best prospectors in California, we expect to hear of a big find. The Kincaid Flat Gravel mine started up this week, with persevering, energetic P. J. C. Reylard as superintendent. Five men are employed at present, but soon an additional force will be put on. This week, Louis Blanding, the metallurgist and mining expert, visited the Garibaldi mine, situated on the Calaveras side of the Stanislaus river. The property has been under Mr. Blanding's immediate superintendency, and through his judicious and energetic management has been fully developed.

ALICE.—Tuolumne Independent, Dec. 19: The Alice mine at Jackass Hill, from which Hank Gale took \$14,000, and others took as much more, is now leased by Mr. Wickham, who recently found a prospect and is now in to as handsome a formation as one would wish to see. The quartz is thickly shot with sulphurets and iron cubes, the slate is highly metallized, and there are feeders and crossings in sight.

NOONDAY.—The shaft of the Noonday mine is now down 125 feet. The vein is 18 inches wide, and mills \$100 per ton. The sulphurets have not yet been worked, but a test shows them to be very rich. The mine is owned by John Woodside, Al Butheuth and F. H. Warner.

NEVADA.

Montgomery District.

A GOLD CAMP.—Pioche Record, 12: News of a most encouraging nature has just come from the new gold regions of Southern Nevada. A 20-stamp quartz mill is already on the ground. Miners and prospectors are hastening hither from all directions. An authentic report says that the Montgomery M. Co. has a quartz ledge which assumed the enormous width of 24 feet and is exposed along the surface for almost the entire length of the claim; two ounces of gold to the ton are said to be contained in the rock. Montgomery district, which was either discovered by Wm. Montgomery or the Mackey Bros., of Pahrangat valley, is located in Nye county, Nevada, 150 miles southwesterly from Pahrangat valley, and close to the line of Lincoln county. Shortly after the discovery of a permanent gold-bearing ledge, Mr. Montgomery formed a company of California gentlemen and began active and systematic prospecting. Subsequently, last spring, a two-stamp test mill was erected and put into operation. After thoroughly testing the ores by the milling process with this small plant, the company became assured of the great success of their enterprise, and forthwith gave orders for a 20-stamp quartz mill, the last of which is now on the ground. Millmen have been put to work and the plant, it is hoped, will soon be completed and put into active operation. The work of piping the necessary water for about five miles to the millsite is also being put through with diligence. The principle vein to be operated by the Montgomery Co. is said to be 24 feet in width, exposed along the surface 125 feet and developed down for a distance of 150 feet. This company has, in addition to the above property, taken a bond on one of the principal claims owned by the Mackey Bros. and adjoining their own; the terms of which are not made public. The mill was taken from this seemingly bright spot by way of the Southern Pacific railroad of California to Daggett, from whence it was hauled by wagon over 160 miles in a southeasterly direction. The prospectors are going in nearly all directions, being attracted by the glowing reports that are now becoming current. Last month every foot-loose miner and some others left Pioche for that section. Two-ounce free-milling gold quartz is not to be sneezed at. The location, it is true, is a little remote, but the freight on gold bullion, figured at so much per ton will not likely be thought burdensome. Further information is learned from an interview with Edward Shean, a prospector and miner, who is just in from the district. He says the future of the camp, in his opinion, is fully assured; but the immediate outlook is not pointing toward any particular rush. The Montgomery Co., he claims, owns ten mines already and still shows a tendency toward gathering more. The main claim, evidently the one formerly described, he said, is about 14 or 15 feet in width and assays from \$12 to \$15 in gold. The 20-stamp mill is not a 20-stamp mill, but a Huntington mill, which is about equivalent in its crushing capacity. The camp is a good one for prospectors to go to, he continued, provided they have plenty of money to put up for supplies which are worth more than double what one could get them for at Pioche. But it is no place for a man to go to looking for work, as the ore is too easily mined and there is none other than the one company operating there.

Robinson District.

AN IMPORTANT LEASE.—Eureka Sentinel, Dec. 19: A. Jackson and Nathan, Kind & Co. have leased the Keystone mine of Robinson district, White Pine, to Chas. Rudeen, Gus Benson and Andy Olsen for a term of 28 months. Consider-

able new machinery is to be added, and the mine put in thorough order at once. The lessees are skilled in leaching and will work the ores by that process. They are also first-class miners and responsible business men. We anticipate that they will make a complete success at Robinson. The past record of the Keystone is good, and there is still a great deal of ore in sight. Featherstone, who formerly owned it, used to ship ore here by team that worked \$200 per ton. The many friends in Eureka of the lessees will wish them the greatest good luck in their new field.

Pine Nut District.

A REVIVAL.—Carson Tribune, Dec. 17: All Carson is again excited over Pine Nut. Joe Rayerat brought in this morning several sacks of ore from the Snow Flake claim, one of the series of locations belonging to the Monarch Consolidated, that discounts anything seen from the Zirn mine. The ore was taken from a shaft 18 feet deep. It is decomposed red quartz, and is studded with gold from the size of a pin-head to that of a pea. The location is about a mile and a half southwest of the Zirn mine. About a dozen shafts have been sunk in a range of four acres, and good prospects found in all, so it is generally believed that an extensive ore deposit exists. This strike, following that in the Zirn mine satisfies all Pine Nut locators of the richness and extent of the ore body; so look out for another rush to Pine Nut.

Tuscarora District.

NORTH COMMONWEALTH.—Times-Review, Dec. 18: Hoisted 25 cars second class ore, \$45 per ton, and shipped to railroad 31 tons first class ore; will assay \$450 per ton.

DEL MONTE.—Second level—Joint raise in the vein, extended eight feet on the line, continues to expose good ore, two and one-half feet being high grade, assays from which return \$275 per ton.

COMMONWEALTH.—Fourth level—South drift from No. 2 raise advanced 15 feet, ore coming in the face of the drift.

NEVADA QUEEN.—Second level—No. 1 south drift advanced 10 feet, showing some good ore. No. 2 south drift extended 18 feet.

NORTH BELLE ISLE.—No. 3 north drift, 400-foot level, has been advanced 20 feet, the vein is three feet wide, part of which is first class ore. No. 2 winze, below the intermediate drift and above the 400-foot level, sunk 10 feet, giving low assays. South 500 from Belle Isle crosscut extended 15 feet, giving low assays. The stopes above the 400 and 500-foot levels are producing as usual.

NAVAJO.—No. 1 upraise, 150-foot level, extended up eight feet, the vein is not looking so well. No. 3 upraise, below 350-foot level, extended up 16 feet and connected with the level. Have started a winze from 350-foot level.

BELLE ISLE.—North Drift, 150-foot level, has been extended 140 feet in hard rock. Line crosscut on 350-foot level extended 11 feet. The stopes on Nos. 2 and 3 veins are producing as usual.

Tybo District.

THE NYE CO.—Belmont Courier, Dec. 17: It is to be hoped that the negotiations now pending for the sale of the Nye Mining Co.'s property at Tybo, including the famous 2-G mine, will be consummated. Then will our Tybo neighbors enjoy lively times again. Tybo is undoubtedly one of the best mining districts in Eastern Nevada.

Washoe District.

HALE AND NORCROSS.—Virginia Chronicle, Dec. 19: On the 1650 level, the north lateral drift from the new station is advanced 100 feet; face in quartz and porphyry of low assay value. East crosscut No. 1, started from the north drift at a point 75 feet north from the station, is advanced 35 feet. The last 12 feet of this crosscut is in low-grade quartz. On the Sutoro tunnel level, the south drift was advanced 30 feet, making its total distance south from the station 165 feet; face is in porphyry. West crosscut No. 1, started from south drift 100 feet south of the station, was advanced 35 feet, making its total distance 75 feet; face in porphyry and quartz. Have sent through the Sutoro tunnel 520 cars of waste rock during the week.

SAVAGE.—During the week, we have hoisted 663 cars of ore from the 500, 750, 950 and 1100 levels, and shipped to the Nevada mill 545 tons, and milled 530 tons, average battery assay, \$18. We have bullion on hand amounting to \$12,674.68. On the 1450 level, we have commenced putting in square sets and stopping out ore from west crosscut No. 1. The ore is fair grade.

BELCHER.—Have stopped the north drift from the 300 level station and run a west crosscut from the north end of it a distance of 40 feet. It disclosed a width of about 29 feet of quartz, but of too low a grade to extract. Will start a raise from the lateral drift, with the intention of cutting this quartz at a point between the 300 and 200 levels, to ascertain if the quartz improves in grade at that point. Are saving from eight to ten tons of fair-grade ore per day from the south drift from the fifth floor of the raise above the 1300 level.

KENTUCK.—Have stopped the west crosscut from the north lateral drift on the 500 level, and have started an east crosscut opposite it, which is out 13 feet. The face is in a mixture of quartz and porphyry giving low assays. The east crosscut from the bottom of the 1000 level, north winze, is now out 55 feet. The face is in low-grade quartz and porphyry. Are still following south on the ore streak from the 100 level, north raise, with nothing new to report.

JUSTICE.—The raise from the east drift, 612 level, was advanced 10 feet during the week. The top is in a mixture of clay and porphyry. The south drift from the top of the raise, same level, is now out a total distance of 30 feet; face in quartz giving low assays. The north raise on the 622 level is now up 46 feet. The top is in low-grade quartz.

CROWN POINT.—West crosscut No. 3, 500 level, is now out a total distance of 60 feet; face in porphyry. This crosscut has about 25 feet to go to reach the quartz encountered in No. 2 crosscut. The west crosscut from the south lateral drift, 600 level, is now out a total distance of 323 feet; face in hard porphyry.

CONFIDENCE-CHALLENGE.—The joint Confidence and Challenge north lateral drift, 200 level, is in 999 feet; face in quartz of no value. The joint Confidence and Challenge drift on 300 level is now in 588 feet; face in quartz of no value.

IMPERIAL.—The raise from the 400 level is up 400 feet; the top shows quartz having no value. Are still taking out some ore found in the old fill-

ANCHORING.—The new guides in the Anchor shaft being properly placed and all arrangements completed for putting in another cable as soon as the new wire cable arrives from New York, and it is expected every day. Active sinking will not begin until the new cable is ready to run, though some little work is now being done. A shot put in the other day blew out a piece of the iron casting in the bore-hole, and considerable trouble was experienced in getting it out. Every precaution will be taken to prevent a bore-hole from clogging and no serious trouble is anticipated.

MECHANICAL PROGRESS.

Possibly an Expensive Mistake.

It will be recollected that after our naval engineers had presented their plans and specifications for the construction of the war ship Philadelphia, lately launched, that the Secretary of the Navy was not altogether pleased with the plans as furnished and actually purchased from Sir William Armstrong & Sons, shipbuilders on the Tyne, England, some important modifications of the American designs and had them interpolated. This was done against the earnest remonstrances of both the designers and builders.

Since the launch the public has been somewhat startled by the publication in the New York Times of articles which seem to establish the fact that a serious mistake has been made. In these articles it is claimed that the ship, by such changes, has been given so low a metacentric height as to make it more than probable that she would roll dangerously in a rough sea, if indeed she did not turn bottom upward. This is thought to be due mainly to the fact that considerably lighter machinery was put into the vessel than the original designs called for, thus reducing the weight below the water line, while a protective deck, heavier than that contemplated by the original designs, increased the weight above the water line, the result being that the vessel is dangerously top-heavy. It is estimated by Naval Constructor McIntyre that \$275,000 should be spent in alterations upon the vessel, which, if it turns out to be necessary will prove quite an expensive lesson as to the risk assumed in materially altering a design for a structure of any kind without going over the whole work in the most thorough manner.

It ought to be a well-understood fact that when alterations of any moment are to be made in the designs of an important structure, there is usually no safe plan except to go through every step in the designing of the complete structure as amended.

It should also be further understood that we have in this country as skillful engineers and constructors as any which can be found in Europe. If the lesson, which, in all probability will be taught by this inexcusable blunder, does not cost the Government over a quarter of a million dollars it will be fortunate. It is full time that the influence of the anglo-maniacs of New York, in both the financial and political administration of the Government at Washington was wiped out and that forever.

THE TRAVELING SIDEWALK, to which invention allusion has already been made in these columns, is being put to a practical test at the Chicago Exhibition grounds, where a circular walk has been built. Max E. Schmidt is the inventor. It is said to be attracting considerable attention among engineers, numbers of whom have been invited to inspect it in operation. It consists of an elevated series of continuous sidewalks, parallel and level, and so arranged that the first moves at a slow rate of speed, and each successive one at a speed double that of the preceding. The motive force is supplied by electric motors attached to the trucks and situated several hundred feet apart. The electric current is supplied by the ordinary power dynamo. The plan of the invention is to elevate the walks above the surface of the street after the fashion of the ordinary elevated railroad. The weight, however, is reduced to a minimum, and the entire structure, it is claimed, can be supported by a single series of steel posts. The stairways to the walk are placed at short intervals in the block, and an automatic fare collector at the foot of each approach does away with the regular conductor. Once upon the stationary platform extending along the entire side of the walk, the passenger can step upon the slowly moving walk, thence upon the next, and finally upon the third, which, according to the present calculation, will move constantly at the rate of nine miles an hour. The sample walk now in operation at the World's Fair grounds is 900 feet in length and extends in a circle. It has been built with a view to obtain a permit from the World's Fair directors for the operation of a walk 3½ miles long and extending entirely around the grounds during the fair.

LOGS CUT WITH A KNIFE.—There was exhibited recently at Greenpoint, L. I., says the New York Herald, a machine which it is thought may possibly revolutionize the lumber business. This machine cuts lumber without any waste, and there is no sawdust whatever. In cutting lumber with a saw there is a great loss which goes into sawdust. The new invention, which is called the Bradley draw-outting machine, is designed to cut thin boards and planks, and will cut in different thicknesses varying from one thirty-second of an inch to an inch. The inventor is Thomas S. Crane, and he has been at work on it for five years. The saving of lumber that this machine will effect will be very great. Mr. Lewis said that in small lumber, one-quarter and one-half inch in thickness, one-quarter of the log is lost in sawdust. Then another eighth is lost in planing, and the lumberman in preparing his lumber for use loses three-eighths of the log. This new invention will save nearly all that. The machine was recently seen for the first time. It cut cherry, ash, birch and maple in thicknesses from a sixteenth to a half inch. It is intended

to be placed in the woods and to cut the trees as soon as they are felled. Green wood is cut more easily than seasoned wood, but logs were cut up that had lain in the yard ten years. The machine weighs forty tons.

SEAMLESS STEEL TUBES are in great demand. It is said that the demand for a tube superior to any in use at the time, for the manufacture of bicycles, was the active stimulus which brought about that really important invention. Strength, combined with lightness of material, is a necessity in a first-class bicycle, so when the seamless steel tube was brought out a few years ago, combining both strength and lightness, there was an immediate demand for it. The market has been growing ever since, not only with the rapid development of the cycling trade, but in other directions. Wherever, in fact, metal tubing is required that has to withstand a great strain, and where steel can be used, the seamless tube is in growing request. It has added materially to the efficacy and applicability of hydraulic machinery; a ½-inch tube with a core of ¼-inch can be drawn in steel to withstand a pressure of 1000 pounds on the square inch. It is now being used largely for boilers instead of copper tubing, and of course costs very much less, while its life is as long, and when made of best material, it is more reliable than ordinary copper boiler tubes. The English Government is using a large quantity in the making of search lights. In fact, the directions in which such tubing, with its superiority in weight, strength and finish, may be used are endless. Success in the manufacture of seamless steel tubing depends on two factors. The first is the employment of the very finest steel procurable, steel which is thoroughly homogeneous, and which has a high ductility and tenacity, and the machinery must be of enormous power, and constructed with the view to draw the metal with perfect truth and steadiness.

SIMPLE YET PROFITABLE INVENTIONS.—The history and growth of inventions are subjects in which all are interested. The difficulties and rebuffs which inventors have had to undergo in the perfecting of their ideas, their perseverance and ultimate success, form most interesting reading. Vast sums of money are brought in by apparently simple inventions requiring no great mechanical knowledge. The accounts of these read more like the wildest fiction than simple fact, and are sufficient to make the least covetous among us yellow with jealousy. The stylographic pen brought in \$200,000 a year; the india rubber tip to pencils \$100,000; metal plates for protecting the soles and heels of boots brought in \$1,250,000 in all; the roller skate \$1,000,000. A clergyman realized \$2000 a week by the invention of a toy; another toy, the return ball (a wooden ball with a piece of elastic attached) brought in an annual income of \$50,000; the "Dancing Jim Orow" \$75,000 a year. The inventor of a copper cap for children's boots was able to leave his heir \$2,000,000; whilst Singer, of sewing machine fame, left at his death nearly \$15,000,000. There are however, other and wonderful things which people have thought it worth while to patent, strong in the hope of making a big fortune in the near future, only to find in so many cases that their inventions were impracticable and very often perfectly ridiculous.

A PERPETUAL MOTION MACHINE has been long sought for, and the idea of its materialization has of late years been a subject of much unbelief and ridicule. Probably the nearest point to such a thing which will ever be reached has been attained and is described in the following paragraph which we clip from an Eastern exchange: "It is not generally known that a novel motor, which appears to fulfill the conditions of perpetual motion, has been running at the United States Patent Office in Washington for many years. The inventor made the claim of perpetual motion, but it is hardly correct. Perpetual motion is said to exist in a machine that 'when once started will continue to run until worn out.' This machine operates by the power given out by the different expansion of metals under varying conditions, and is so small and carefully constructed that if there was absolutely no change in temperature of the room it would run when once started, 38 days before stopping. If it were possible to put it in some place for this length of time, as the center of the earth, where the temperature would be constant, it would stop, so that it does not fulfill the conditions of perpetual motion; but that cannot be done where the machine now is, so it has run for many years without stopping, and probably will continue to run until it wears out."

A BLACKSMITH'S TOOLS of the present day are almost identical with those used in the same trade over 300 years ago. The reason is because most of the blacksmiths work, both old and new, is now relegated to the modern machine shop. The blacksmith no longer makes his own horseshoes or nails. He buys them at the hardware store. No machinery has yet been devised for shoeing a horse, or doing scarcely any of the little odd jobs which go to the blacksmith shop. Yet the blacksmith shop is a public necessity.

A NEW LEAD-HEADED NAIL for putting on corrugated roofs has made its appearance in the London markets. The head flattens under the blow of the hammer and thus prevents leaking.

SCIENTIFIC PROGRESS.

The Electrical Atom?

Possibilities Connected With the Future of Electricity.

At a recent dinner of the Institute of Electrical Engineers, held in London, the well-known scientist, Prof. Wm. Crookes, in the course of some remarks, is reported to have spoken as follows:

We have happily outgrown the preposterous notion that research in any department of science is mere waste of time. It is now generally admitted that pure science, irrespective of practical applications, benefits both the investigator himself and greatly enriches the community. "It lessens him that gives and him that takes." Between the frog's leg quivering on Galvani's work-table and the successful telegraph or telephone, there exists a direct filiation. Without the one we could not have the other.

We know little as yet concerning the mighty agency of electricity. "Substantialists" tell us it is a kind of matter. Others view it, not as matter, but as a form of energy. Others, again, reject both these views. Prof. Lodge considers it "a form, or rather a mode of manifestation, of the ether." Prof. Nikola Tesla demurs to the view of Prof. Lodge, but thinks that "nothing stands in the way of our calling electricity ether associated with matter, or bound ether." High authorities cannot even yet agree, whether we have one electricity or two opposite electricities. The only way to tackle the difficulty is to persevere in experiment and observation. If we never learn what electricity is, if, like life or like matter, it should remain an unknown quantity, we shall assuredly discover more about its attributes and its functions.

The light which the study of electricity throws upon a variety of chemical phenomena—witnessed alike in our little laboratories and in the vast laboratories of the earth and the sun—cannot be overlooked. The old electrochemical theory of Berzelius is superseded, and a new and wider theory is opening out. The facts of electrolysis are by no means either completely detected or coordinated. They point to the great probability that electricity is atomic; that an electrical atom is as definite a quantity as a chemical atom. The electrical attraction between two chemical atoms, being a trillion times greater than gravitational attraction, is probably the force with which chemistry is most deeply concerned.

It has been computed that, in a single cubic foot of the ether which fills all space, there are locked up 10,000 foot tons of energy which have hitherto escaped notice. To unlock this boundless store and subdue it to the service of man is a task which awaits the electrician of the future. The latest researches give well-founded hopes that this vast storehouse of power is not hopelessly inaccessible. Up to the present time, we have been acquainted with only a very narrow range of ethereal vibrations, from extreme red on the one side to ultra violet on the other—say from three ten-millionths of a millimeter to eight ten-millionths of a millimeter. Within this comparatively limited range of ethereal vibrations, and the equally narrow range of sound vibrations, we have been hitherto limited to receive and communicate all the knowledge which we share with other rational beings. Whether vibrations of the ether, slower than those which affect us as light, may not be constantly at work around us, we have until lately never seriously inquired. But the researches of Lodge in England, and Hertz in Germany, give us an almost infinite range of ethereal vibrations or electrical rays, from wave lengths of thousands of miles down to a few feet. Here is unfolded to us a new and astonishing universe—one which it is hard to conceive should be powerless to transmit and impart intelligence.

Experimentalists are reducing the wave lengths of the electrical rays. With every diminution in size of the apparatus the wave lengths get shorter, and could we construct Leyden jars of molecular dimensions the rays might fall within the narrow limits of visibility. We do not yet know how the molecule could be got to act as a Leyden jar, yet it is not improbable that the discontinuous phosphorescent light emitted from certain of the rare earths, when excited by a high tension current in a high vacuum, is really an artificial production of these electrical rays, sufficiently short to affect our organs of sight. If such a light could be produced more easily and more regularly, it would be far more economical than light from a flame or from the arc, as very little of the energy in play is expended in the form of heat rays. Of such production of light, nature supplies us with examples in the glow-worm and the fireflies. Their light, though sufficiently energetic to be seen at a considerable distance, is accompanied by no liberation of heat capable of detection by our most delicate instruments.

By means of currents alternating with very high frequency, Prof. Nikola Tesla has succeeded in passing by induction through the glass of a lamp energy sufficient to keep a filament in a state of incandescence without the use of connecting wires. He has even lighted a room by producing in it such a condition that an illuminating appliance may be placed anywhere and lighted without being electrically connected with anything. He has produced

the required condition by creating in the room a powerful electrostatic field alternating very rapidly. He suspends two sheets of metal, each connected with one of the terminals of the coil. If an exhausted tube is carried anywhere between these sheets, or placed anywhere, it remains always luminous.

The extent to which this method of illumination may be practically available, experiments alone can decide. In any case, our insight into the possibilities of static electricity has been extended, and the ordinary electric machine will cease to be regarded as a mere toy.

Alternating currents have at the best a rather doubtful reputation, but it follows from Tesla's researches that as the rapidity of the alternation increases they become not more dangerous, but less so. It further appears that a true flame can now be produced without chemical aid—a flame which yields light and heat without the consumption of material and without any chemical process. To this end we require improved methods for producing excessively frequent alternations and enormous potentials. Shall we be able to obtain these by tapping the ether? If so, we may view the prospective exhaustion of our coal fields with indifference. We shall at once solve the smoke question, and thus dissolve all possible coal rings.

Electricity seems destined to annex the whole field not merely of optics, but probably also of thermotics.

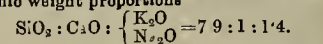
Rays of light will not pass through a wall, nor, as we know only too well, through a dense fog. But electrical rays of a foot or two wave length of which we have spoken will easily pierce such media, which for them will be transparent.

Another tempting field for research, scarcely yet attacked by pioneers, awaits exploration. I allude to the mutual action of electricity and life. No sound man of science endorses the assertion that "electricity is life," nor can we even venture to speak of life as one of the varieties or manifestations of energy. Nevertheless, electricity has an important influence upon vital phenomena, and in turn set in action by the living being—animal or vegetable. We have electric fishes—one of them the prototype of the torpedo of modern warfare. There is the electric eel which used to be met with in gardens and roads about Hornsey Rise, there is also an electric centipede. In the study of such facts and such relations the scientific electrician has before him an almost infinite field of inquiry.

The slower vibrations to which I have referred reveal the bewildering possibility of telegraphy without wires, posts, cables, or any of our present costly appliances. It is vain to attempt to picture the marvels of the future. Progress, as Dean Swift observed, may be too fast for endurance. Sufficient for this generation are the wonders thereof.

THE HUMAN BREATH will not remove mountains, but it has power sufficient to raise objects which have considerable weight. It will not scatter a regiment of soldiers, nor uproot trees as the fables sometimes tell us with pictorial illustrations. Yet it contains a surprising amount of leverage, which is evidenced by the long report which a paper bag filled with the breath will produce when smashed between the hands. The following experiment demonstrates the elementary power of the human breath still more forcibly: Take a large bag of good, heavy paper, lay it on the table and cover the closed end of it with several books—a Webster Unabridged and a family Bible, for instance—then blow into the bag, filling or inflating it with air, and you will soon see that it will overthrow the books, i. e., remove a small mountain.

A NEW GLASS.—Herren Max Kahler and Martini of Berlin have invented a new kind of glass, the composition of which corresponds to the atomic weight proportions



This glass is excellently adapted, on account of its high resisting powers, to the manufacture of chemical utensils. Vessels made of it do not, it is stated, contract mold, even when left standing for months, evince no inclination to harbor dust, and possess high powers of resistance against water and diluted acids. Drinking glasses, cooking jars, retorts, pipes, chemical burettes and pipettes are among the articles produced by the firm mentioned from the new vitreous substance.

THE GEOGRAPHICAL SOCIETY of the Pacific Coast presents very encouraging evidence of prosperity. This success is largely due to the efforts of its Secretary, Col. Grant. It has reached a very healthy financial standing, and will soon file articles of incorporation and take a permanent stand among the many other institutions in this city which are engaged in the promotion of scientific work and study.

EXTRACTING COPPER BY ELECTRICITY.—An English exchange says that Messrs. Siemens and Halske are experimenting with much encouragement upon a process of extracting copper from the ore by a new electrolytic method. The whole process lasts barely ten hours, and the loss is scarcely one-half per cent, so that even the poorest ore can be rendered remunerative.

DOUBLE BELTS.—One or more belts running independently on the top of another will add much to the transmission of power.

ELECTRICITY.

Electricity in Coal Mines.

The annual report of R. M. Hascittine, Chief Inspector of Mines for Ohio, recently published, devotes considerable space to the consideration of electric power as used in the several coal mines which have adopted it. It contains a very elaborate table, giving a statement of the total electric horse power absorbed by the motor while making a cut, the amount lost in the motor and machine, while running light with the feed on and with it off; the quantity lost in motor and machine while backing out of the cut just made; the net electrical horse power required to make the cut; the time occupied in making the cut, in and out; the horse-power required to undercut one square foot in one minute, the speed of armature, etc. There are 22 headings in all in the report, making it very full and elaborate. He made 41 tests. There are now a very large number of coal mines in this country employing electricity for various purposes. One trouble in this use of electricity appears to be a disinclination on the part of mine operators to either allow a sufficient quantity of copper put into the line, for future requirements, when the plant is first laid out, or to sufficiently reinforce it when required because of the increase in distance from the dynamo, or in the number of machines working. A great loss of power results from this neglect. In regard to motors, a correspondent of the *Electrical World* says: It is absolutely necessary that they be the lightest possible, and very low, the width and length also being quite limited. Mine work is the severest test to which electric power can be applied; it is worse than street railroad work.

Electric machinery for coal mines must be so made that it can stand anything, comparatively, in the way of hard work and abuse. These qualities and light weight are not consistent.

Electricity in the Dunsmuir Coal Mines.

The *Vancouver World* holds that electricity is likely to work a wonderful change in the industry of coal mining. It is believed that a great deal of the danger to life which now surrounds mining in the bowels of the earth will soon be minimized by the use of electricity instead of powders or explosives. Already the Messrs. Dunsmuir of San Francisco, at their Union mines in Comox are utilizing electricity, and so satisfactory have the experiments proved that it is their intention to introduce the new system into all their pits. Since they began to use electricity the output of their mines at the Lake, in Comox, has already been doubled. The coal brought to the surface now averages 500 tons per day, and it is pronounced by experts to be a first-class article. Four pits are being worked. It is expected that the present output will be largely increased shortly, as a couple more electric machines and motors are to be introduced. The ease and facility with which it can be conveyed, the safety with which it can be used, demonstrates the fact that electricity is the best and most economical power yet known, which can be used in coal mines.

Electric Haulage in Mines

Perhaps one of the most important applications of electricity to mining is that of haulage, which is already largely used in England, and is fast being introduced in the mines in this country. In the system employed in the English collieries, the locomotive does not depend for grip on its own weight, but gets a direct pull on a cable lying between the rails, parallel to the road, and fixed at either end. This cable passes over a sprocket wheel on the locomotive or trolley, and is driven through suitable gearing by an electric motor. The motor is supplied with energy from a bare copper wire arranged on the roof or the side of the road. It is needless to say that such a trolley is only applicable to roads free from gas. The chief advantage of the system lies in the light weight of the trolley in proportion to the heavy tractive effort it can exert. It will be principally used as an auxiliary power on short steep lengths of otherwise fairly level roads, where horses are generally used, and will be found in many cases to be a great saving in horse flesh.

The first installation of electric mining machinery in the South Wales coal fields has recently been made by Messrs. Orompton & Co. of Chelmsford, England. It consists of an electrical haulage plant designed to replace 27 horses and many handlers and door-boys, and to enable the output of the colliery to be increased by 100 tons per day. The winding gear adopted in this plant is of the novel form employed in the main and tail rope system. The motor is placed horizontally at one end of a wrought-iron frame, which forms the bed for the winding drum and spur wheel. The drum-shaft, which is of steel, is driven from a countershaft by means of spur gearing, and the motor drives the countershaft by means of a six one-inch ropes. This plant will haul coal from three different parts of the pit, and although these are not at the present far from the motor, it is expected that coal will have to be dealt with nearly a mile distant.

The Electric Miners' Safety Lamp

Bids fair to become a most perfect success. It will not only by its brighter glow give additional facility for work, but it will also introduce the new and most important factor of safety. The ideal electric safety lamp must be self-con-

tained, light in weight, simple in construction, durable and not too expensive. Where the light is most required is where the miner is at work, and as he is constantly shifting his position, it is essential that he should have a portable light. From time to time attempts have been made to produce such a light as is actually needed. A large number have been presented, but they have been generally found too heavy for convenient use. A good miner's lamp must be of simple and solid construction, as light as possible, and easy to maintain and recharge. It should yield a constant light of one or one and a half candle power for not less than eight hours, and it should be cheap. The results of experiments thus far certainly show a marked advance in the construction of electric safety lamps, and it is to be sincerely hoped that the day is not far distant when the present oil lamps will be used only for testing purposes, and a cheap, practical and convenient incandescent lamp will be used for working.

Electricity in Mining.

Electricity is rapidly making its way into the mine, where it is taking the place of hand-work for cutting in coal mines, and of steam and compressed air in drilling, hauling, stamping, pumping, etc., in all kinds of mines. In fact, it bids fair to work a great revolution in mining industry everywhere. In nearly every mining camp there is an abundance of water power, which, by means of electricity, can be economically carried to any point when it may be needed. The combination of water power and the electric motor is fast introducing a most economical factor into mining. The recent improvements in the mode of transmitting power by electricity are being everywhere watched with much interest, and especially by mine owners.

Electricity in the Colorado Mines.

According to the *Denver Republican*, electricity is already employed in many of the mines of Colorado. In the Telluride district, the Gold King stamp-mill is being successfully operated by electricity generated 2½ miles distant. This is the pioneer enterprise in that district. Several other mine owners there have been prompt to notice the economy of the new system and are making preparations to introduce it. The Belmont Company will soon convey to its mill the water power which is abundant in the valley three miles below, and many others will follow at an early day.

The *Republican* says: "The saving to the mine owners and the increase in profits which will accrue to owners of mines high up the mountain or away from convenient water power can readily be seen. Mills can now be built at the mines and the concentrates rather than the ores conveyed to the valley below. Mills that have been forced to burn wood or coal, can, through this method, operate more economically, and the many low-grade properties to which the expense of power has been a bar to operation can be worked at a profit. It is a step forward in mining, and when thoroughly understood and put into common use will add millions to the output of Colorado mines."

In Montana Also

Extensive preparations are being made to utilize, for mining purposes, water power now running to waste. According to the *Mining Journal*, large preparations are being made to utilize the Flint Creek Falls, by the electrical transmission of the power there to be developed, to various points in that vicinity. Works that will cost not less than \$100,000 are being erected to convey this power to Philipsburg, seven miles distant, and to other localities. The water which forms this creek issues from the ground a short distance above, in warm springs, and will not cool enough to freeze in the distance from the springs to the water-wheels, a great advantage in that cold region. The water-wheels employed will be of the Pelton type and ten in number. The power will be transmitted over ten heavy copper wires. This power will be used at Granite, Anaconda, Ramsey, Philipsburg and possibly even to Butte. The transmission to Anaconda will be 17 miles, where 80 per cent of the power sent out will be utilized; 90 per cent will be delivered at the nearer localities named. Butte will be the most distant locality, where only 65 per cent will be realized. When these works are in operation, it is expected that the copper from the Anaconda mine will be received at the mine, instead of being sent away, as is now done. An experimental electric refinery has already been put in operation at the mine, which is said to have proved a success.

The dam for impounding the water has already been completed. It is of stone and constructed in a most permanent manner. The entire water works will be completed by next spring, and when completed, will, it is said, be more extensive than any other of the kind in America.

The Electric Mining Percussion Drill.

One of Edison's late inventions, is just now attracting much attention among miners. It is said to bore into the hardest granite, at the rate of three inches per minute, and requires comparatively little power to operate it. It can be worked anywhere within three miles of the dynamo, which drives it. Another form of this drill is intended for prospecting work—a core drill. It will bore 150 feet into the earth, and bring up samples of everything through which it passes.

We understand that the first electric mining

drill ever ordered for California arrived in Shasta from the East a short time ago, consigned to the Gladstone Mining Co., whose property is situated on Kline gulch, in the French Gulch mining district. In addition to drills, the Edison Co. also manufactures electric hoists, electric fans and electric pumps, showing that Edison has turned his attention in earnest to mining work, and many are expecting marvelous results from this branch of electricity in the near future.

GOOD HEALTH.

Health of the State.

The November circular of the State Board of Health says that there were 1099 deaths in California during the past month. Among other things, the circular says:

Mortality reports from 109 cities, towns, villages and localities, having an aggregate population of 739,577, show the total number of deaths from all causes in November to have been 1099, making a death rate of 17.64 per 1000 for the year.

There were 178 deaths due to consumption, acute pneumonia 76, acute bronchitis 39, congestion of the lungs 6, diarrhea and dysentery 18, cholera infantum 44, other diseases of the stomach and bowels 46, diphtheria 35, croup 25, scarlatina 5, measles 2, whooping cough 4, typhoid fever 37, malarial fever 5, cerebro-spinal fever 4, cancer 45, heart diseases 83, alcoholism 12, all other causes 471.

A mild type of scarlatina prevailed quite generally throughout the State, there being but five fatalities reported. Whooping-cough has been reported as epidemic in several localities. Diseases of the respiratory organs have been very numerous; also diseases of the stomach and bowels. These may, in the majority of cases, be attributed to the quite general prevalence of la grippe, 449 cases of which were reported. It was reported as epidemic in 15 localities, where the number of cases were not given. It is reported as being very frequently associated with bronchitis and pneumonia. Rheumatism and neuralgia have been quite generally prevalent.

No cases of smallpox have been known to exist in the State for several months, and the entire United States has been quite free from this dreaded malady during the year. The Province of Quebec has, however, had 135 cases, all arising from one person that started the contagion. During November, it has been reported in New Jersey, Pennsylvania, Ohio, Tennessee and Texas. It will doubtless be controlled as far as practicable, but all efforts in that direction have in the past proven of no avail where unvaccinated people have been exposed to the disease. It is quite as likely to leap across the continent as to leap from Quebec to Texas, and this likelihood should be a sufficient warning for those who are unprotected to be vaccinated without delay. There should also be a more strict compliance with the law denying admittance to unvaccinated children in the public schools. This should be done without exciting unnecessary alarm, but the necessity for such action should be generally understood, and be insisted upon, especially in the schools.

TO PREVENT CONSUMPTION.—At a time when so much is said about Koch's consumption cure, it may be worth while to call attention to the remarks of Dr. G. W. Hamilton at a late meeting of the British Association. He said that consumption was a disease of civilization, produced by causes which reduced the standard breathing capacity below a certain level. To prevent this disease, it is necessary to use the body to the extent its strength demanded, and to see that the work it had to perform was carried on under conditions favorable to the body. It was also desirable so to arrange habits and surroundings that their tendency as a whole should be to develop the lungs. Close and badly ventilated or heated rooms, occupations which involve stooping and cramped positions, corsets, tight-fitting clothes, should be avoided; "nipping" should also be prohibited; as much time as possible should be spent in active exercise in the open air; bedrooms should be well ventilated; wool should be worn next the skin; the body should be held erect; deep inspirations in breathing should be taken through the nose, and the cultivation of all kinds of athletic exercise should be encouraged; but above all, he considered a great deal depended on prompt and early treatment of the victims of consumption.—*New York Ledger*.

THE GRIP is growing more serious in its ravage throughout Germany. The seventeen hundred patients occupying one whole wing of the great Charity Hospital at Berlin are practically all suffering from the malady. One hundred cadets in the military school at Coslin, and a large proportion of the seamen of the Baltic squadron, are similarly afflicted. It is raging in many parts of the United Kingdom and increasing in severity. From Plymouth comes the announcement of the death of Major-General Pedler, who died after a short illness. The epidemic seems also to be spreading throughout the East, though it is less virulent than in Europe. In this State it has not taken the form of an epidemic. Hollister seems to be an exception, in which town some 400 cases have been reported—many of a serious nature. One prominent citizen has died from its effects.

USEFUL INFORMATION.

HOW TO PRESERVE POTATOES.—A prize of 1000 francs was not long ago offered by a French association for a method of keeping potatoes and other vegetables. Some insulating substance, such as wood ashes, sawdust or rye straw, with sand, was used by four or five of the competitors. The plan of M. Schrihaux, who gained the prize, is to put the potatoes for ten hours in a 1½ to 2 per cent. solution of commercial sulphuric acid, when, after being thoroughly dried, they will keep without alteration more than a year. The same solution may be used many times. The acid penetrates the eyes to the depth of about one-fortieth of an inch, which serves to destroy their sprouting power; it does not have any appreciable effect upon the skin of the potatoes; but of course potatoes so treated are worthless for planting. A barrel or tank of any kind will do for the treatment. The acid is so dilute it does not affect the wood. Chemical analysis shows that potatoes treated by this process are as nutritious and healthful after eighteen months as when freshly dug.

TO FACILITATE ROPE CLIMBING.—A device recently patented by a French inventor is designed to facilitate rope climbing, while at the same time, permitting the climber to have free use of his hands. The apparatus consists of two boards, joined by a strong hinge, with a hole passing through both the hinge and the boards. The extremities of the boards are provided with straps, which can be fastened to the feet of the man using the device. The method of climbing by this apparatus is simple. When the feet are attached to the boards are lifted, the rope is free, but the moment the feet are pressed down on the two boards, the rope is firmly gripped. It is necessary, therefore, only to lift the body by both hands as far as possible, and then it can be held by the hinged clamps until another lift is made. By the use of a belt to hold the body close to the rope, the hands may be left free. This device is designed especially for the use of firemen and painters, also to serve as a fire escape.

THE WORLD'S HONEY PRODUCERS.—The largest beekeeper in the world is Mr. Harrison of this State, who has 6000 hives, producing 200,000 pounds of honey yearly. In Greece there are 30,000 hives, producing 3,000,000 pounds of honey; in Denmark 80,000, producing 2,000,000; in Russia 110,000, producing the same; in Belgium 200,000, producing 5,000,000; in Holland 240,000, producing 6,000,000; in France 950,000, producing 23,000,000; in Germany 1,450,000 and in Austria 1,550,000, each producing 40,000,000 pounds of honey. But in the United States there are 2,900,000 hives, belonging to 70,000 beekeepers, and producing 62,000,000 pounds of honey yearly.—*Californian*.

THE MOST WONDERFUL ARTESIAN WELL, perhaps, in the world, is found in Huron, North Dakota. It throws up water to the height of about 100 feet, and the amount is estimated at from 8000 to 10,000 gallons per minute. Even at the lowest figures, enough water is ejected to furnish every man woman and child in the State of North Dakota with at least four gallons of water every four hours. As to the pressure, that has not yet been ascertained, but from tests already made, it is known to be considerably more than 200 pounds to the square inch. With a fair test it is likely to reach 228 pounds.

TELEGRAPH TO THE SANDWICH ISLANDS.—There is a good prospect of a submarine telegraph cable from the Pacific Coast to the Hawaiian Islands. The first half of the survey shows that no great difficulty will be encountered in laying the cable over the 850 miles of ocean bed that has thus far been sounded. If the western half of the route offers no greater obstacles, and there is no reason to believe that it will, it is likely that the United States and the Hawaiian Governments will grant concessions, which will insure the desired communications, for which the Sandwich Islanders are especially anxious.

AN INGENUOUS INVENTION is an orange peeler that removes the coat without cutting the inner skin. It is claimed that 1000 oranges may be peeled without soiling finger or glove, or losing a drop of juice. The peeler is a piece of wire, nickel-plated, very much in the shape of a button-hook, but with a tiny blade let into the inner bend of the hook. When the point of the hook is drawn into the fruit it slides between the pulp and the peel without danger of entering either, while the blade divides the peel easily and rapidly, after which it may be removed without trouble.

AN AUTOMATIC RAILROAD GATE has been devised which is designed to obviate the necessity of keeping a watchman to close and open gates at railroad crossings, such gates being, with this construction, closed and opened by a train passing in either direction. The device for opening and shutting the gate is said to be very simple and reliable in its action.

A BIG BEAN PATCH.—The Lima bean ranch of Dixie Thompson, in Ventura county, is said to be the largest in the world, 2200 acres being planted to beans. The crop this year was about 103 carloads.



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SAN FRANCISCO:

Saturday, December 26, 1891.

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See Advertising Columns.

Passing Events.

This number of the PRESS closes the volume and the year. We hope to have in the coming year not only all our old readers but many new ones as well. This is a good time for renewal of subscriptions, by the way. While you are making good resolutions for the new year, make one to pay for your paper promptly in advance.

Another one of those annoying rulings by the Department has been made by which a miner is compelled to show valuable mineral, whether he has reached it or not. Both California and Montana will fight this matter in Congress this session and try and bring the Department to their senses.

In the different counties of the State, miners' meetings are being held and delegates are being selected for the State Mining Convention, to be held in this city January 20th. San Francisco will have the largest delegation—60—and these will be appointed this week. The miners are in earnest, and the press of the State is now giving the subject attention.

WM. HAM HALL, consulting engineer, has moved into new offices in the new Mercantile Library building, 530 Golden Gate avenue.

Close of the Volume.

The MINING AND SCIENTIFIC PRESS, the oldest mining journal in the United States, closes Volume LXIII with this number. It has kept abreast of the times in mining, metallurgical and mechanical improvements, and brought to the attention of its readers such things as would be of advantage to them in their business. The wide range of subjects treated, is indicated by the full index on the last page. Among other things, it will be noticed that the electrical field is rapidly growing and that that subject has received special attention. In relation to mining, the most recent electrical appliances have been illustrated and described in this volume. As fast as anything of interest in this line comes to the front, the PRESS presents it to its readers.

The current mining news from a wide area has been given weekly in a condensed form, enabling the reader to know at a glance what is going on in the various camps. The fields of industrial and mechanical progress, engineering and kindred topics have been searched for news and information of practical value to the progressive man. Our readers familiar with the usefulness of the PRESS would assist us by calling the attention of others to its merits. Mining men especially ought not to be without the paper which represents their interest on the Pacific Coast. We hope to still further improve the paper the coming year, and can assure our patrons that no efforts will be spared in making the PRESS a welcome visitor to mine, cabin and workshop.

San Francisco Miners' Meeting.

On Tuesday afternoon a number of gentlemen interested in mining met at the State Mining Boreau in this city, for the purpose of organizing and electing delegates to the State Miners' Convention which meets next month. Among those present were Ross E. Browne, W. A. Luckhardt, Chas. Hoffman, Wm. Ireland, Jr., T. R. Churoh, Chas. G. Yale, Judson Wheeler, Abraham Breese, E. Wheaton, S. J. Hendy, J. T. McCall, J. O. Whitney, S. E. Holcombe, E. Charron, Ferd. Formahs, Felix Chappelle, W. Ang. Knapp, R. McMurray, J. Z. Davis, Phil. Dedelsheimer and W. C. Ralston.

The meeting was called to order by Chas. G. Yale (of the MINING AND SCIENTIFIC PRESS), who is a member of the Executive Committee of the Placer County Mining Association. He stated that in accordance with the call issued at Auburn this meeting had been called to select delegates. It was not desired that any speeches or arguments be made. The subject was well understood by all present. Copies of the call and address had been distributed, and it was only necessary to organize and let the delegates selected attend to the business.

On motion, Robt. McMurray was elected chairman, and W. C. Ralston secretary.

On motion, the resolutions adopted at Auburn were endorsed.

The call for a State Convention was read by the secretary, and a motion was also carried that a committee should be appointed to make out a list of delegates, to be submitted to the Mayor of San Francisco, he to choose the 60 representatives.

The committee appointed consisted of Chas. G. Yale, Ross E. Browne, W. C. Ralston, T. R. Church and Wm. Ireland, Jr. Chairman McMurray was, on motion, added to the committee.

The delegates will be chosen next week. A full list of suitable names is being prepared by the committee, from which the Mayor will choose the delegates to represent San Francisco.

The American District Steam Co. of Lookport, N. Y., propose to arrange a plant for the transmission of steam for power and heating purposes in this city. If the plans are carried out, some \$400,000 will be expended.

The salt works at Salton, Colorado desert, which were overflowed by the "Salton sea" have again started up, and the first carload of salt was hauled from the marsh last Saturday. The mill will soon be running.

The Senate Committee on Mines and Mining of this Congress is composed of the following gentlemen: Stewart (chairman), Jones of Nevada, Power, Warren, Felton, Bate, Call, Chilton and Irby.

Absurd Department Rulings.

Mr. Assistant Secretary Chandler is likely to hear a very loud and unpleasant buzzing about his ears shortly. The miners of this country do not intend to stand any longer the absurd rulings now prevailing in the Land and Interior Departments. Mr. Assistant Secretary Chandler and the other officials who are so entirely ignorant of mining affairs, yet have control of them, will have to abandon some of the laws they have themselves been making in favor of laws made by Congress. The matter is to be brought forcibly to the attention of Congress, and the Departments will probably receive some instructions which will change their tune.

Here is a case in point, decided on the 18th inst.:

Mr. Chandler made it clearly known to-day that where there is a contest over whether land is agricultural or mineral, valuable mineral must be produced, and mining on the theory that precious metals exist in the ground in dispute cannot be considered good evidence. The case decided was that of John Hey and seven others, forming the Dutch Ravine Tunnel Co., against Wm. Kern and Charles H. F. Werner, who had homestead and pre-emption claims respectively in the Sacramento land district, part of the land being in the ravine named. After the filings of these men had been made and about the time Kern was ready to make final proof, the mining company appeared on the ground, filed application for a mineral patent and contested the agricultural entries. A decision was given against them by the Land Commissioner and they appealed. Mr. Chandler quotes precedents showing that the burden of proof is on the contestants to show their mineral character, and they were required to show by a preponderance of testimony that the land is more valuable for mining than for agricultural purposes as a present fact, and that it must be shown as a present fact that the lands are mineral, and not from the theory that the lands may hereafter produce it. The evidence showed the uncertainties and rainbow-chasing features of mining as it is too often carried on.

Specklog of the mining company, Mr. Chandler says: "They have run a tunnel into the hillsides several hundred feet through the rock in an attempt to reach an ancient river channel which they supposed to exist, and which they think would yield gold-bearing gravel if they could only strike it. They have expended \$15,000 in this attempt, but they have not struck the ancient river channel."

"Mining on the theory that precious metals exist in the ground in dispute cannot be considered good evidence; valuable mineral must be produced," says Mr. Assistant Secretary Chandler.

If Mr. Chandler, in his wisdom, will show the miners of California how to produce the valuable mineral from under the lava-capped divides of this State, without first running their tunnels, he will confer a great boon. He talks wisely about the "uncertainties and rainbow-chasing features of mining as it is too often carried on."

The fact is, Mr. Chandler does not know what he is talking about. His position is absurd in the last degree. We have known about the "dead rivers" under the lava-capped divides in California for the last 30 years and more, but that knowledge has not yet got as far as Washington. They do not know about or understand the drift-mining proposition. In fact, the law does not yet recognize it.

To open such mines requires often years of time and hundreds of thousands of dollars. Does Mr. Chandler suppose the miners are such asses as to spend their time and money on a place where there is no hope of reward? Does he not suppose that if they could get at the gold without this expense, they would do it at once?

What business has a mere ephemeral Secretary or Assistant Secretary to require valuable mineral to be produced from the ground in question. The U. S. laws do not require it. The Secretary or Assistant does not require the agricultural claimant to produce a crop or part of a crop. He asks the miner to show his gold actually; he does not ask the farmer to show a cash crop or turnip. As to the land being mineral or agricultural, the value is equally prospective in each case. The theory that precious metals are in the ground is as good as that theory which supposes agricultural products may result from cultivation. The miner knows his business. He does not burrow into a mountain, at vast expenditure of time and money, unless he expects something for his labor. He is a much better judge of the matter than Mr. Secretary in his armchair at Washington.

One loses patience when seeing the mineral domain of the country passing from the prospectors' hands into that of railroad companies and farmers for whom neither the people nor the laws ever intended it.

It is true the Assistant Secretary quotes precedents for his action, but the precedents are the rulings of himself and equally ignorant predecessors in office. They are not based on any law of Congress.

The attention of the present Congress will be called to these misapplications of the law. The Mining Act of May 10, 1872, has been almost entirely set aside by a lot of officials who know nothing of mines or mining methods. The evil has now become so great that the miners of the country have lost patience and will make a united fight for their rights. It is almost impossible to obtain patent for mineral land, and yearly large tracts of the mineral domain are removed from entry. It is time this should stop, and it shortly will be stopped. Congress must take the matter in hand, and bring the department up "with a round turn."

Preparing for the Mining Convention.

Already twenty-two counties of the State have been heard from as preparing for the coming Miners' Convention in this city. In several counties meetings have been held by the miners, and delegates have been selected. In others the meetings have been called and the men will be chosen in due time. The subject has received attention generally from the press of the State and the people are ready to hear what the miners have to say.

There is one mistaken idea, however, in this connection, which many persons have. It is not to be a hydraulic mining convention, but one in which quartz, drift, river and hydraulic miners participate. The quartz and drift miners want to bring to the attention of Congress the alienation of the mineral domain by agricultural and railroad claimants; and the unjust rulings of the Departments which are practically nullifying the mining laws of the country. The hydraulic miners want Congress to pay heed to the report of the U. S. Engineers and want some kind of relief so they can work their mines. They recognize that injury has been done to the farming interests of a section of the State by their debris, and they now want permission to build the dams recommended by the U. S. Commission so the debris can be held back, and they can work their mines again. These, briefly, are the subjects which will be considered by the miners at their convention on January 20th.

ACADEMY OF SCIENCES.—At the meeting of the Academy on Monday evening the committee on nominations recommended the following as the regular ticket for the annual election of officers: President, H. W. Harkness; first vice-president, H. H. Behr; second vice-president, J. G. Cooper; recording secretary, J. O. Schupham; corresponding secretary, Frederik Gutzkow; librarian, Carlos Troyer; director of the museum, J. Z. Davis; trustees, C. F. Crocker, W. C. Burnett, B. E. Hayes, E. J. Moler, George C. Perkins and Adolph Soto. All the persons recommended by the committee are the present incumbents, with the exception of Mr. Suto, whose name is substituted in place of that of Irving M. Scott, who declined to serve on account of his inability to be present in the city. The election of officers will be held on Monday, January 4th, the polls to be open from 9 A. M. to 6 P. M. W. E. Bryant and J. W. Hinckley were appointed judges, and C. I. Keeler and A. Madre, inspectors of election.

ANTI-DEBRIS MEETING.—A meeting of the Advisory Board of the Anti-Debris Association was held at Marysville on Monday. The situation with regard to hydraulic mining and what the coming Miners' Convention is likely to bring forth was thoroughly canvassed, and a resolution was adopted asking that the River Improvement Convention, with an increased delegation, be convened again at an early date, either in Sacramento or San Francisco. The Supervisors of the valley counties have been asked to increase their membership to the convention.

ANOTHER big strike has been made in the "Old Abe" mine, at White Oaks, N. M. The new vein is six feet wide and rich in gold.

The Water Front of San Francisco.

(Concluded from page 415.)

extended entirely around the water front from one end of the city to the other. It is intended to furnish track facilities for all railroads reaching the city, and belongs, like the rest of the water front property, to the State. No one railroad has any more right to its use than another, and those which use it pay certain fixed charges per ton and per car. It is a double-track steel road with a third rail for the accommodation of narrow-gauge cars. The locomotive is a saddle-tank switching engine of the most improved type, weighing 58 tons. It was made at the Baldwin Locomotive Works specially for this road.

A special ferry slip has been built at the foot of Lombard street for the ferry-boats carrying

The State receives \$900 a month for each of these sheds and adjoining space and sidetracks from the two narrow-gauge railroad companies now using them. There are wide platforms for handling freight, and there is plenty of room on all sides for teams, etc. Close by, on Davis street, is the platform for discharging coal. This plan shows section one of the belt road, which is all that has thus far been built. It will gradually be extended as the other work on the water front progresses. There is a paved driveway outside of the railroad tracks which goes entirely around the front. This is 80 feet wide, and is used by teams only. The roadway inside the tracks is also 80 feet wide.

The great grain sheds which form such an important feature of the city front, also belong to the State. They commence at the foot of Francisco street and extend along around to Stockton street. They are 2000 feet in length

points on the city front. Vessels of course pay wharfage, but it is only two cents per ton for small vessels and for large ones \$4 for the first 200 tons and three-quarters of a cent for each additional ton. Lighters pay a dockage charge of one cent per ton. Small barges pay two cents per ton and large ones the same as ocean vessels. Dockage means the charges for vessels occupying berths at the docks; tolls, the charge for merchandise passing over the wharves, and wharfage the charge for leaving merchandise on the wharves longer than the specified time.

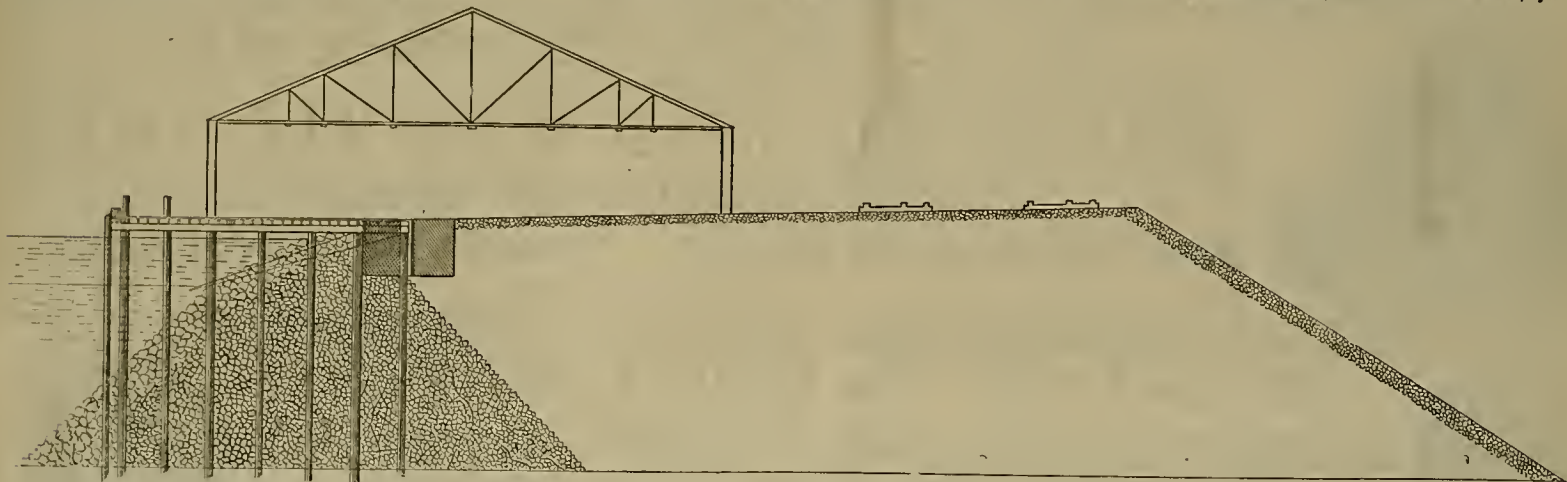
These facts should be borne in mind, for the great grain industry of the State is put to the smallest possible burden at this port. The vessels that pay dockage are mainly British merchantmen; but the grain, etc., itself pays no charges over the wharves or in the warehouses except when stored over the time specified as above.

center of the city and near the large warehouses.

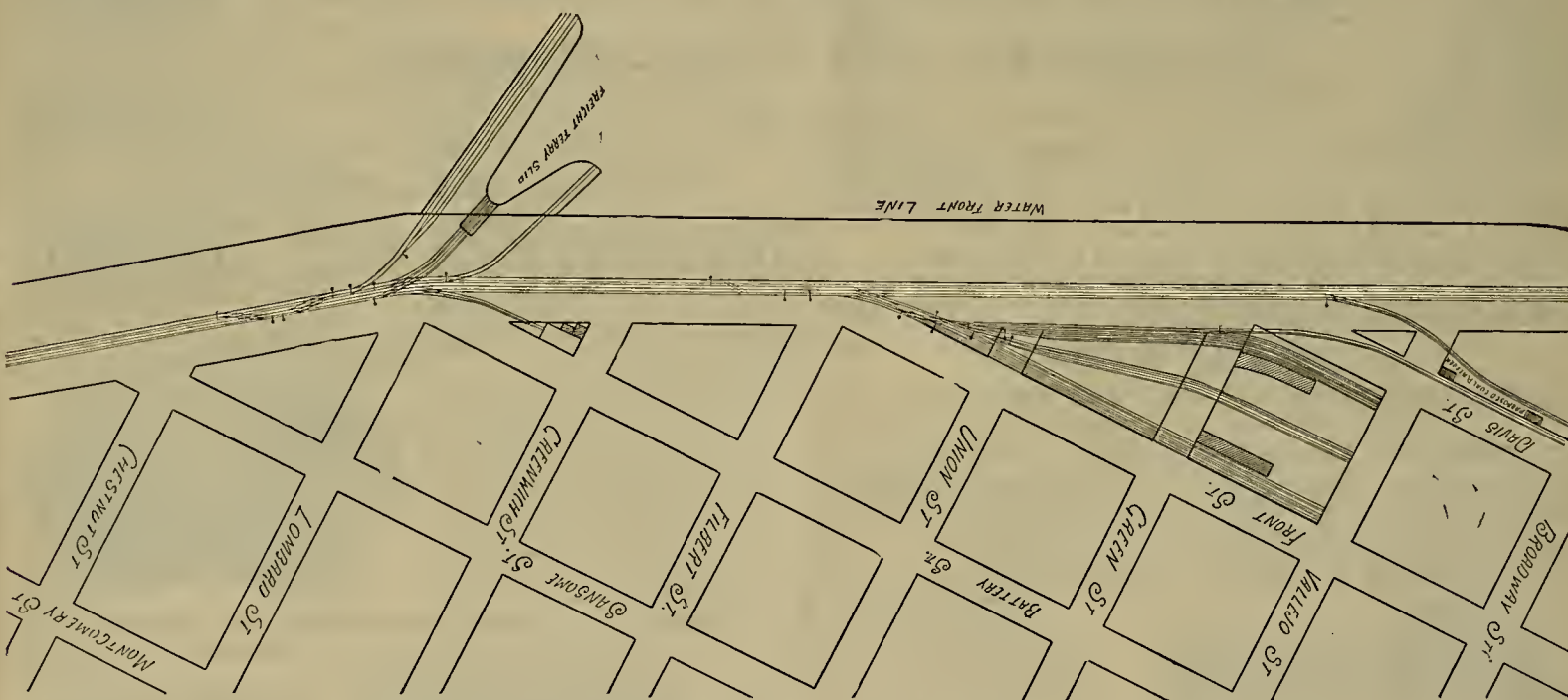
The China, Central, India, South and Dry Dock basins at the south end of the city will be retained as part of the navigable waters of the bay, and free entrance will be secured to them through the structures across their openings. It will be some years before work will be done at these large basins.

The Board of State Harbor Commissioners consists of C. T. Bassett (President), C. O. Alexander and H. W. Brown. J. J. Keegan is Secretary of the Board and Sol D. Rogers assistant. The chief engineer of the Board, under whom all the work along the water front is carried out, is Marston Manson, and his assistant is Marston Campbell.

The Belt railroad is operated under the Engineers' Department of the Commission. The principal employees are: J. J. Saxton, yard-



IDEAL TRANSVERSE SECTION OF SEA WALL, EMBANKMENT, BELT RAILROAD AND GRAIN WAREHOUSES.



PLAN OF SECTION ONE OF BELT RAILROAD ON SAN FRANCISCO WATER FRONT.

freight cars, and the tracks connect with this slip. From here the loaded cars are hauled on the tracks to the warehouses and depots, where the freight is discharged, thus saving long haulage by wagons and trucks from the freight depots of the railroad companies, which are necessarily on the outskirts of the city. The cars are handled, when leaving the freight boats, by the employees and engines of the Harbor Commissioners, the railroad companies having nothing whatever to do with the operation of the belt railroad. None of these locomotives come on this road. They bring the cars to their boats to the freight slip, and these cars are carried by State employees to the destined warehouses or freight platforms. When the cars are unloaded, they are again returned to the freight boats. Cars should also, of course, be loaded at warehouses and manufacturing and the goods shipped away, so that much expense in handling may be saved.

We have prepared a plan map showing that portion of this belt railroad thus far put in operation. The freight ferry slip or dock is shown at the foot of Lombard street. At the foot of Greenwich street, on the small triangular lot, is the roundhouse where the locomotive is kept, and where are the offices of the yardmaster, engineer, etc. Between Front, Davis, Vallejo and Green streets are the freight sheds where the cars are discharged or loaded. The approaches to these depots or sheds are paved with stone, and there are offices in the buildings for clerks, etc.

are 100 feet wide and 16 feet high on the sides. The roof is supported by trusses. There is a space of 20 feet between the outside of the shed and the edge of the wharf, where vessels may load or discharge. Inside, and along the roadway, extend the tracks of the belt railroad. The grain may be brought in cars, deposited in the warehouses, and then be placed on the ships with very little handling. These sheds will be lengthened as occasion demands. A cross section of these sheds is shown in one of the cuts given herewith.

No tolls are charged on grain, flour or breadstuffs for passing over wharves under the Harbor Commissioners' jurisdiction, but such articles are subject to the same rules and rates of wharfage as are imposed on other merchandise except on Sections 1 and 2 of the sea wall, and that is the point where the grain warehouses are situated. The term "grain" includes barley, oats, corn and rye; the term "flour" includes only the flour of wheat, and "millstuffs" includes bran, middlings, shorts and ground feed. Grain, flour, millstuffs, beans and seeds are allowed to remain in the grain sheds for five days without any charge. After that they must pay five cents per ton, and at the end of thirty days must pay ten cents per ton per day.

It will be seen by this that as far as farm products in grain, etc., are concerned the Harbor Commission does not represent a "toll-gatherer by the sea" as many people suppose, but it specially omits tolls as well as warehouse charges for a particular time and at certain

Another thing: The Harbor Commissioners have made a rule and abide by it, that "The use or keeping of intoxicating liquors on any wharf, or in any office or on any premises under the jurisdiction of the Board, is forbidden, and the violation of this order by any officer or employee of the Board will be deemed sufficient cause for the dismissal of the offender." The Board permits no saloon privileges on any property under its jurisdiction.

As to coal, thus far only a small platform has been prepared for landing and loading this, but better arrangements will be made in time. As it is, however, some 20 carloads a day are now shipped on the South Pacific Coast R. R. along the line to Santa Cruz. The coal comes direct from the steamers to the cars, and no longer has to be put in schooners and again discharged.

The San Francisco and North Pacific R. R. formerly had no place for handling its freight on the city front, but now it has one of the two depots or sheds, giving the Sonoma and Mendocino county products cheap access to the city, which they have not practically had before. The cars can now discharge directly into trucks and wagons, and the freight be delivered easily and quickly. The Southern Pacific Co. has as yet no facilities offered by the belt railroad, but its freight depot will be built on the next section. Then the handling by team from Fourth and Townsend streets can be done away with to a great extent, and goods delivered nearer the

master; Fred Barto, engineer; J. P. Cleese, fireman; and El Yale and L. E. Stinson, switchmen and brakemen. At present, the cars are brought on the freight boats and placed in position at the freight depots at night, ready to be discharged and loaded in the daytime.

We have only been able, on this occasion, to give a brief sketch of the general features of the improvements along our water front, but it will serve to give an idea of what has been done in the way of shipping facilities at the principal port of the Pacific. At some other time, it is our intention to speak more in detail of the engineering features of the work, which have been carried out under Chief Engineer Manson's direction upon instructions from the Board.

THE PALM MINE.—Work continues in the shaft of the Palmside mine in King canyon, and three shifts, working eight hours each, are deepening it as fast as possible, but the rock has been hard and progress slow. The shaft was down 160 feet, including a 20-foot slump; to this about 100 feet have been added. The work is very costly, on account of hardness of the rock, the outlay being from \$57 to \$30 per foot. A little less than 10 feet per week have lately been added to the depth of the shaft, which would be considered very slow work on rock of ordinary hardness, with three changes of miners daily.—Independent Callistogian.



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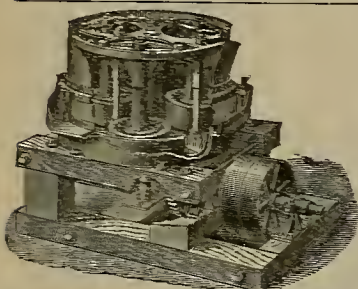
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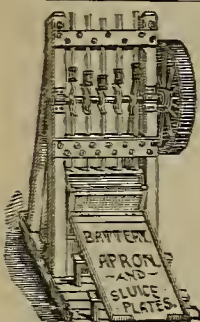
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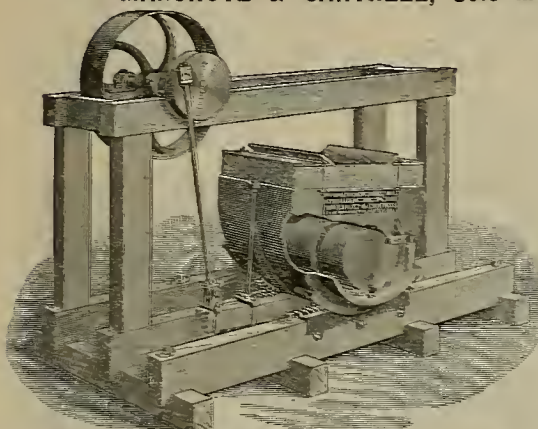
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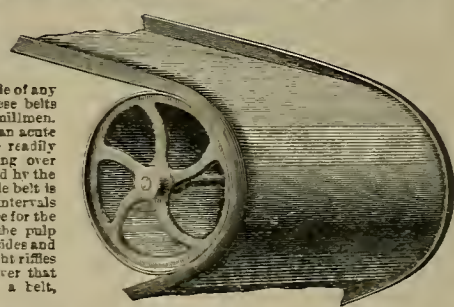
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House Committees.

Speaker Cripe has prepared a complete list of the House Committees. From this, we publish those of interest to our readers, as follows:

Mines and Mining—W. H. Cowles, Cooper, Peet, Campbell, Pendleton, Camblott, Arnold, Bowman, Miller, Townshend, Stevenson, Post, Hoff and Smith.

Rivers and Harbors—N. C. Banchard, Catohings, Stewart, Lester of Georgia, Clark of Alabama, Haynes, Wadock, Jones, Byrns, Henderson of Illinois, Herman, Stephen, Stone of Pennsylvania and Quackenbush.

Railroads—J. B. Riley, Latham, Lane, Brown, Ellis, Covert, Castle, Coolidge, Snodgrass, Raines, Filck, Lind, Taylor of Ohio and Orain.

Public Lands—T. C. McKee, Pendleton, Tucker, Merman, Bailey, Darmand, Searley, Stout, Pickler, Townshend, Sweet and Clarke of Wyoming.

Territories—J. A. Washington, Kilgore, Manser, Campbell, Parrett, Branch, Terry, Jerry Simpson, Donovan, Rife, Smith of Illinois, Perkins, O'Donnell and Joseph.

Railways and Canals—T. C. Catohings, Lester of Virginia, Cate, Bentley, Bietzboover, Casely, Cobb of Missouri, Halverson, Davis, Randall, Bergen, Hall and Loud.

Labor—J. C. Tarnsey, Wilcox, Dixon, McKelghan, Dugan, Bunting, Capehart, Cansey, Davis, Buchanan of New Jersey, Brosius, Haugen and Wilson of Washington.

Coinage, Weights and Measures—Bland, Charles, Tracy, Williams, Kilgore, Robinson, Pierce, Eppes, Williams of Massachusetts, McKelghan, Bartine, Taylor of Illinois, Stone of Pennsylvania and Johnson of North Dakota.

Inquiry into the records of the members of House Committee on Coinage, Weights and Measures show that, by past utterances or votes, 8 out of the 13 members of the committee have declared in favor of free coinage, while three other members are outspoken against free coinage, and a fourth is said to be unquestionably against free coinage.

The members in favor of free coinage are Bland of Missouri, Williams of Illinois, Kilgore of Texas, Robertson of Louisiana, Pierce of Tennessee, Eppes of Virginia, McKelghan of Nebraska, and Bartine of Nevada. Those opposed to free coinage are Tracey of New York, Williams of Massachusetts, Taylor of Illinois and Stone of Pennsylvania. Johnson of North Dakota was not in the last Congress, but he is thought by some to be in favor of free coinage.

The silver men are very well pleased with the Constitution of the Coinage Committee, and regard it as significant of the speaker's purpose to afford an opportunity for the passage of a free-coinage measure. Chairman Bland is the most pronounced Democratic advocate of silver in the House. The silver men regard the fact that Bartine heads the list of Republican members as another indication of the speaker's friendliness toward a liberal silver policy.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DEC. 15, 1891.

- 465,231.—CAR COUPLING—J. T. Aabel, S. F.
465,421.—CULTIVATOR—D. E. Barton, S. F.
465,422.—SHOE FOR CULTIVATORS—D. E. Barton, S. F.
465,152.—WASHING MACHINE—J. S. Bood, Napa, Cal.
465,128.—STEAM ORE STAMP—E. W. Curtiss, Portland, Or.
464,960.—PLIABLE FLANGE PILE CASING—Edward Davis, Redondo, Cal.
465,357.—THRASHER ATTACHMENT—Robert Davis, Modesto, Cal.
465,095.—VALVE—C. I. Hall, S. F.
465,188.—MOP—Charles Moore, Visalia, Cal.
465,207.—LAWN IRRIGATOR—W. A. Russell, Los Angeles, Cal.
465,102.—ORNAMENTING WALLS, ETC.—T. Tucker, Oakland, Cal.
465,302.—HORSE COLLAR STUFFING MACHINE—W. J. Webber, S. F.

The following brief list by telegraph, for Dec. 22, will appear more complete on receipt of mail advices:

California—Jonathan R. Brought, Mojave, vehicle shaft; Sidney R. Deason, electric weather strip; Edwin T. Earl, Los Angeles, ventilator and combined ventilator and refrigerator; John R. Morse, Los Angeles, hydrocarbon burner; Jonas E. Osborne, Daggett, traction wagon-steering apparatus; James Shepherd, San Francisco, extension joint for urinals; Frank E. Tremper, San Francisco, speeding and reversing gear; Joseph S. L. Tuck, San Francisco, excavator; George A. Williams, San Diego, hair-working machine.

Oregon—Andrew Olson, Medawake, stringed musical instrument; Charles W. Tremble, Portland, steam engine; Ellis W. Naxon, Forest Grove, drier case.

Washington—Remembrance L. Kirby, Pomeroy, books. Norm.—Copies of U. S. and foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE WARSHIP TEXAS.—We have been received from Gano G. Kennedy a fine large photograph of the U. S. warship Texas, now being built at Norfolk Navy Yard. She will be completed in a short time.

THE Hale and Norcross suit has been continued until Jan. 4th, when the new defendant, the Nevada Mill Co., Hobart, Hayward, Jones, et al. will file their answer.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

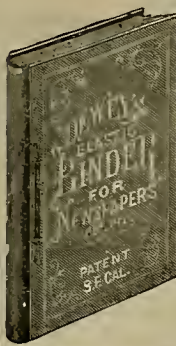
MOP.—Chas. Moore, Visalia, No. 465,188. Dated December 15, 1891. The principal use of this mop is in the cleaning of ceilings. Water is placed in a small trough forming part of the implement. Then the mop is raised by its pole until the mop-roll or cylinder comes in contact with the ceiling. The head of the mop is then moved so that the cylinder or roll will rotate, and as it rotates in the trough it takes up the water therefrom and transfers it to the ceiling. Then the mop-head is moved in the other direction, and as the cylinder or roll cannot turn in this direction (being held by ratchets) it wipes over the previously wetted surface and thus cleans it. Any drip that may fall is caught in a receptacle forming part of the implement. To dry the surface a suitable drying cloth is placed between the clamp jaws, which are bound upon it by setting up a thumb-nut, and this cloth is then wiped over the surface.

WASHING MACHINE.—J. S. Bood, Napa, No. 465,152. Dated Dec. 15, 1891. The object of this invention is to provide for a circulation of the water in the casing in such a manner that it will be driven around, under and behind the clothes, thoroughly permeating them, and by its force, producing in the mass a turning and agitation very beneficial to the cleansing process.

Two gentlemen from Scotland have closed negotiations for and secured deeds to the iron mines at Newberry, on the Atlantic and Pacific railroad, San Diego county. The purchase price was \$200,000.

JOHN DAVIES, originally the owner of the Little Onlet mine at Leadville, died at Chicago on the 20th. He had made and lost several fortunes in mining in California and Colorado, and died penniless.

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AN EASY BINDER.—T. Dewey's Patent Binder, for periodicals, music and other printed sheets, is the handiest, best and cheapest of all economical and practical binders. Newspapers are quickly placed in it and held neatly, as in a cloth-bound book. It is durable and so simple a child can use it. Price, size of Mining and Scientific Press. Rural Press, Watchman, Fraternal Publishing Co.'s journals, Harper's Weekly and Scientific American, 8c; postage 10 cents. Postpaid to subscribers of this paper, 50 cents. Send to this office for illustrated circular. Agents wanted.

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Table of Contents.

The following brief abstract of the contents will give an idea of the branches of the subject treated: General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulae Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulae and Rules; Flow of Water through Openings; Weir Coefficients; Triangular Weirs; Flow of Water Over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water through Short Tubes and Compound Tubes; Flow of Water through Pipes; Tables of Velocities and Cubic Feet Flows for Given Full per Mile and Diameter of Pipe; Coefficient for Bend—Circular and Angular; Flow through Nozzles; Inverted Siphons; Flow of Water in Open Channels; Extensive Tables; Rough and Ready Notes; Hints for Speedy and Approximate Estimates, etc.

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ANNUAL MEETING.

THE REGULAR ANNUAL MEETING OF THE Stockholders of the New El Dorado Gold Mining Company, will be held at the office of the Company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California, on MONDAY, the 4th day of January, 1892, at the hour of twelve o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Saturday, January 23, 1892, at 12 o'clock P. M. J. W. FEW, Secretary. Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

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Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assay; Examples of Dressing; The Melting in Crucibles; Refining; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Course Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12mo. pages, with illustrations, well bound in cloth; 1889. Price, \$1, postpaid. Sold by DEWEY & CO., Publishers, No. 220 Market Street, San Francisco.

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To avoid all needless delay, however, and secure patents at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with \$15 as a first instalment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately and forwarded to the Inventor or for his signature. When he receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously presented to secure the best patent possible. (This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps.) When the patent is allowed, the inventor will be duly notified, and on sending the final Government fee of \$20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

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Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are more satisfactory to the Patent Office than the old cumbersome system of storing up an immense bulk of countless models.

Drawings or sketches, sufficient to illustrate the invention clearly, with a description that will enable us to make a full set of perfect drawings for the Patent Office, is all that we require. A model will answer our purpose as well, however, in cases where the inventor can more easily furnish it.

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The value and even the validity of a patent often depends on the character, clearness and efficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sale had it been skillfully, completely and artistically portrayed. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken to have the invention fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

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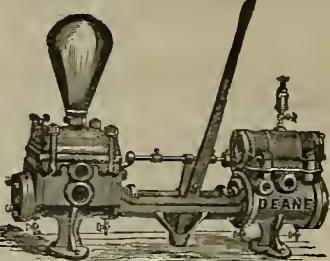
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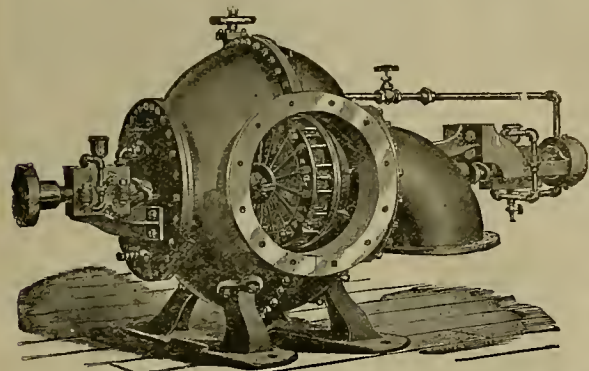
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 24, 1891.

Business continues dull, yet merchants and others are very hopeful of more general prosperity the coming year. The only fears now expressed are that when general trade revives, a speculative mania will set in which is likely to carry the many beyond the limits of discretion. Among iron-workers there is more activity than usually obtains around the holidays, with the outlook quite promising for 1892 being a prosperous year.

The local money market is fairly easy, much easier for the closing weeks of the year than for years past. The fruit crop, wool clip, hop crop and cereal crops are about marketed and at good prices, which have contributed no little to the general ease in money.

New York advices report that in next month there will be larger disbursements for interest, dividends, etc., than ever before made within the history of the country. With the funds returned to the general reservoirs, money will be in oversupply, owing to outside requirements lessening.

Mail advices from London report that the Chancellor of the Exchequer has abandoned his project favoring the issuing of £1 notes by the Bank of England against gold and consols. This course was due to the opposition with which it met.

MEXICAN DOLLARS.—The steamer Belgic for China took out \$90,285 for Hong Kong and \$20,000 for Yokohama. The market is fairly steady at around 75 cents.

QUICKSILVER.—Receipts the past week aggregate 132 flasks locally and 250 flasks by overland railroad. The market is still quoted at \$47.50 by the combination.

SILVER.—The market has shaded off slightly, evidently due to the absence of any bull or speculative movement. Speculators on the bull side were taught a severe lesson at the time Congress passed the present silver law. There appears to be a growing impression that Congress will not be apt to pass a free-coinage bill unless it is confined to the output of American mines. Many claim that even this can not be secured, but a compromise bill passed increasing the monthly purchases. It looks as if Germany's action regarding the international conference on silver will be governed by that of England. On this subject, a press cable from Berlin says: The attitude of the Government upon the question of bimetalism continues to be one of waiting. When William Seligman, who was sent to Europe as a representative of the United States Treasury Department for the purpose of arranging an international conference, was here, sounding the Government, Chancellor von Caprivi stated that the action of Germany and England would depend upon the currency development in Washington. Herr Miquel, Imperial Minister of Finance, is a strong gold party. Secretary von Marshall, although a strong bimetalist, will only act jointly with England for a discussion of the subject.

BORAX.—The local market is steady. New York advices report a slight advance owing to a temporary scarcity.

LIME.—Receipts the past week aggregate 2483 bbls. The market is steady with a fair demand ruling.

LEAD.—The market is unchanged, both on this coast and at the East.

IRON.—The market has a strong tone. The low outward freights ruling at this port and an increasing demand are in favor of both spot and to arrive.

COPPER.—The market hangs around last week's quotations. It now looks as if 1892 is likely to see an improvement in prices, although before it comes, slightly lower ranges in values may obtain. America appears to hold the key to the situation, and it is not at all likely that the Lake Superior companies will miss an opportunity of advancing prices when it can be done with safety to their interest.

TIN.—The markets, both on this coast and at the East, are dull and heavy for pig and plate.

COAL.—Imports the past week aggregate as follows: Swansea 2179 tons, Cardiff 1980, Tacoma 5750, Departure Bay 5534, Coos Bay 750, Seattle 5515, Nantaimo 8803, Comox 4150. Total 34,661. A feature of the receipts the past week was the free arrivals of coal. This increase no doubt is largely due to a decline in outward charters, which makes it unprofitable for deep-sea voyages. The list of vessels headed this way from Australian ports with coals is growing beautifully less. The falling off is due to the fall in outward charters at this port.

Mining Share Market.

Comstock mining shares showed more life at a slight advance on Monday, due to an increase in the battery assays of the ore milled by Con. Virginia. The spurt was short-lived, and as has been the case for weeks past, was followed by still lower prices. The market acts very much as if the stock pools have been losing stock, but who thought is an open question, for it is a well-known fact that outsiders have been steady sellers. The continued levying of assessments is accepted as evidence that the pools have lost stocks and are trying to get them back. While this may be the case, yet it is not at all unreasonable to conclude that the stock pools and mill rings recognize in the publicity during the Hale & Norcross suit of the peculiar methods in vogue on the Comstock lode for looting the mines, combined with brokers organizing against them, the death knell of the system and in lieu thereof, more honest management, and therefore they are crowding stocks down through cross orders so as to buy all they can before forced to work the mines according to the California laws under which they are incorporated. The writer still maintains his faith in a big up move in the near future, but how insiders will manipulate the market in the meantime, so as to buy stock, he does not claim to know.

If the brokers who have united to force a reform in the mine management continue in their good work, and we are assured they will, outside shareholders can reasonably look for much better times in next year. While expecting this, it is also quite certain that the rings will die hard and levy all the

assessments possible so as to discourage outside buying of stock and at the same time to force outside selling.

While our advices from the Comstock mines do not warrant the belief that any bonanza has been or will be found, yet they confirm previous statements made by us that in several of the mines they are developing to the west several levels for extracting ore from the Red lode. This lode is very rich in gold, and while not wide, yet is sufficiently so, owing to the high grade of the ore, to allow the paying of dividends provided the mill rings are compelled to mill the ore for the benefit of the mines and not that of the mills.

Brokers' proxies days are numbered, and those firms which favor it probably to sell their proxies to the highest bidder, will find that their occupation in that line will soon be gone.

Within the past six weeks, or since several of the leading brokers joined to fight the rings, there have been heavy transfers of shares, particularly of the mines against which they are making the test fight.

News from the Comstock mines continue of the most favorable character. Con. Virginia appears to be about ready to open up the west ledge on the 1750 and 1800 foot levels, towards the Best and Belcher line. Ophir is developing several levels preparatory to extracting ore. While the public's attention is drawn to the Kenosha tunnel in Sierra Nevada, very important work elsewhere in the mine is overlooked. Yet it is most too early to expect anything very important from it. In Union and Mexican prospecting and developing work is being vigorously pushed. There was a decided break in the quotations for Gould and Curry shares, which it is said is due to a more favorable condition of the mine. Both Savage and Hale and Norcross are opening up several levels which will surprise the street, provided mine looting can be prevented.

Reports are current of an improvement in Potosi. In both Potosi and Bullion important work is being done, but as the superintendent does not take an oath as to the correctness of his weekly reports, it is said he does not care particularly what he gives to the public, provided it is not favorable, while stocks are down. Chollar is said to be developing a body of ore around the 1200 foot level. The work in Ward shaft, it is said, is not correctly reported by the superintendent. In Exchequer, Alpha, Challenge, Confidence and Yellow Jacket the work is very important, particularly that not made public. Con. Imperial continues to save ore for milling. It now looks as if the management of the Yellow Jacket mine is forced to suspend milling \$7 ore at a cost of about \$15 for extracting and milling. This ore was evidently taken out for the benefit of the mill, and at the same time it afforded an excuse to assess the stock. The news from Kentucky, Belcher and Seg. Belcher is of such a character they deserve close watching. Alta is developing the rich gold find reported on the 1325 foot level. Lady Washington is preparing to run for it.

From the outside mines our advices continue favorable. The mill in the Quijote district has started up. The Bodie mill ought to start up soon. The Tuscarora companies continue to sell their high grade ore at a profit.

Mining shares opened stronger this (Wednesday) morning, and this too in the face of points for lower prices.

SAN FRANCISCO METAL AND COAL MARKET.
THURSDAY, December 24, 1891.
ANTIMONY.—@ 153 English, lb. 16 @ 20
Canton, lb. 9 @ 10
S'f. dist. tool 9 @ 9
Charcoal, 14x20 6 @ 6
Pick & Hammer, 14x20 6 @ 6
Machinery 4 @ 6
All grades jobbing at advance.
COPPER.—@ 22 B. V. steel grade
@ 22 14x20, spot, 6 @ 6
@ 14 Do roofing, 14x20 6 @ 6
@ 12 Do roofing, 14x20 6 @ 6
@ 24 Do, 20x28, 12 @ 12
IRON.—@ 3 Pig iron, spot, 1/2 lb.
@ 4 1/2 Irreg. lar, nom'l — @ 21
STEEL.—@ 16 English, lb. 16 @ 20
Canton, lb. 9 @ 10
S'f. dist. tool 9 @ 9
Charcoal, 14x20 6 @ 6
Pick & Hammer, 14x20 6 @ 6
Machinery 4 @ 6
All grades jobbing at advance.
TIN.—@ 22 B. V. steel grade
@ 22 14x20, spot, 6 @ 6
@ 14 Do roofing, 14x20 6 @ 6
@ 12 Do roofing, 14x20 6 @ 6
@ 24 Do, 20x28, 12 @ 12
COAL.—@ 3 Pig iron, spot, 1/2 lb.
@ 4 1/2 Irreg. lar, nom'l — @ 21
SPOT FROM ABROAD—PER TON.
Eglington, 26 @ 26
Glasgow, 26 @ 26
Am. Soft, No. 1, 25 @ 25
Oregon Pig, 30 @ 30
Garthornie, 26 @ 26
Clay Lane White, 25 @ 25
Shots, No. 1, 25 @ 25
Langdon, 26 @ 26
Thorncliffe, 26 @ 26
Carmichael, 26 @ 26
Barrow, 26 @ 26
Carsofield, 24 @ 24
Per ton, 10 @ 10
IRON ORE.—@ 100
Per ton, 10 @ 10
STEEL.—@ 16 English, lb. 16 @ 20
Canton, lb. 9 @ 10
S'f. dist. tool 9 @ 9
Charcoal, 14x20 6 @ 6
Pick & Hammer, 14x20 6 @ 6
Machinery 4 @ 6
All grades jobbing at advance.
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@ 24 Do, 20x28, 12 @ 12
COAL.—@ 3 Pig iron, spot, 1/2 lb.
@ 4 1/2 Irreg. lar, nom'l — @ 21
SPOT FROM ABROAD—PER TON.
Eglington, 26 @ 26
Glasgow, 26 @ 26
Am. Soft, No. 1, 25 @ 25
Oregon Pig, 30 @ 30
Garthornie, 26 @ 26
Clay Lane White, 25 @ 25
Shots, No. 1, 25 @ 25
Langdon, 26 @ 26
Thorncliffe, 26 @ 26
Carmichael, 26 @ 26
Barrow, 26 @ 26
Carsofield, 24 @ 24
Per ton, 10 @ 10
IRON ORE.—@ 100
Per ton, 10 @ 10
STEEL.—@ 16 English, lb. 16 @ 20
Canton, lb. 9 @ 10
S'f. dist. tool 9 @ 9
Charcoal, 14x20 6 @ 6
Pick & Hammer, 14x20 6 @ 6
Machinery 4 @ 6
All grades jobbing at advance.
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Barrow, 26 @ 26
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Per ton, 10 @ 10
IRON ORE.—@ 100
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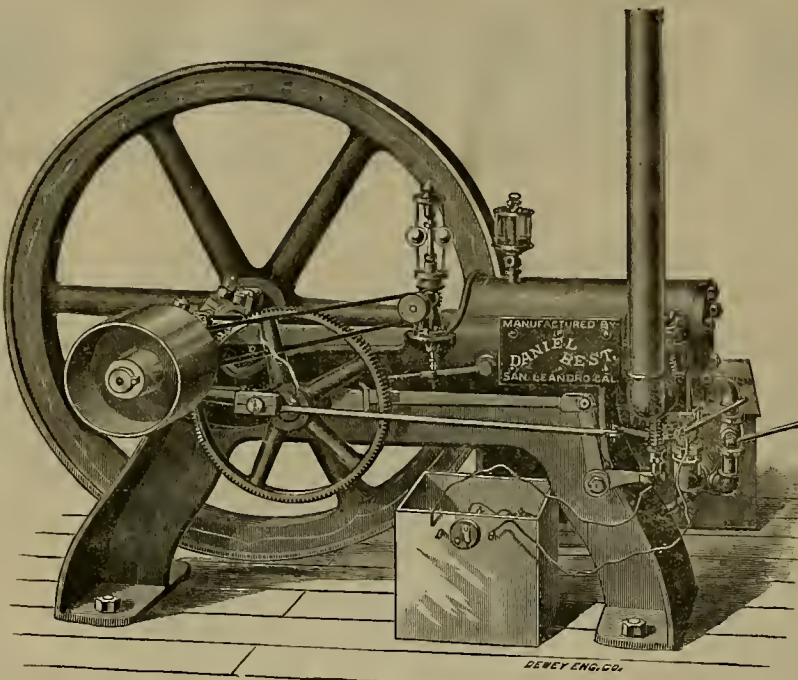
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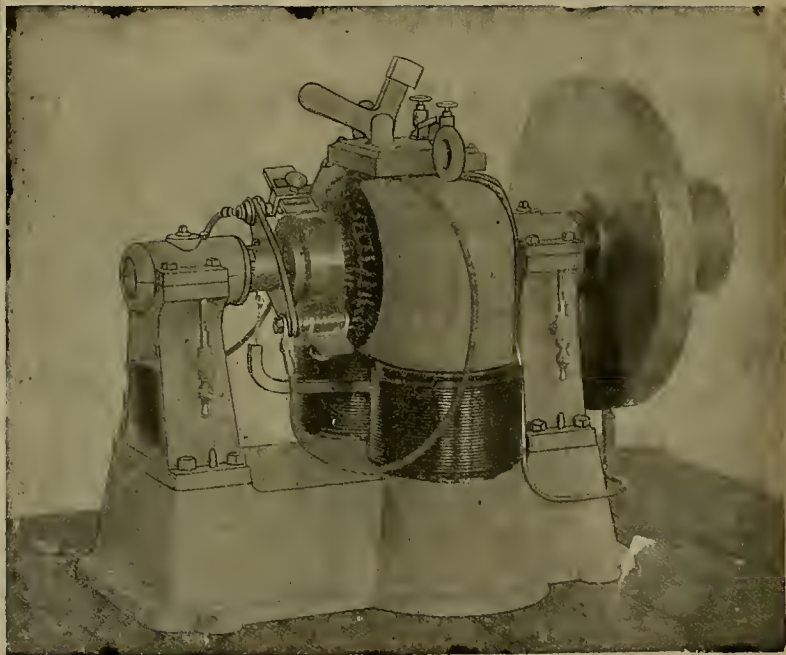
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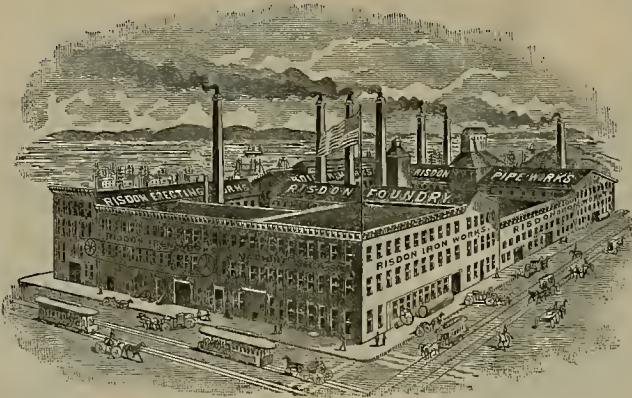
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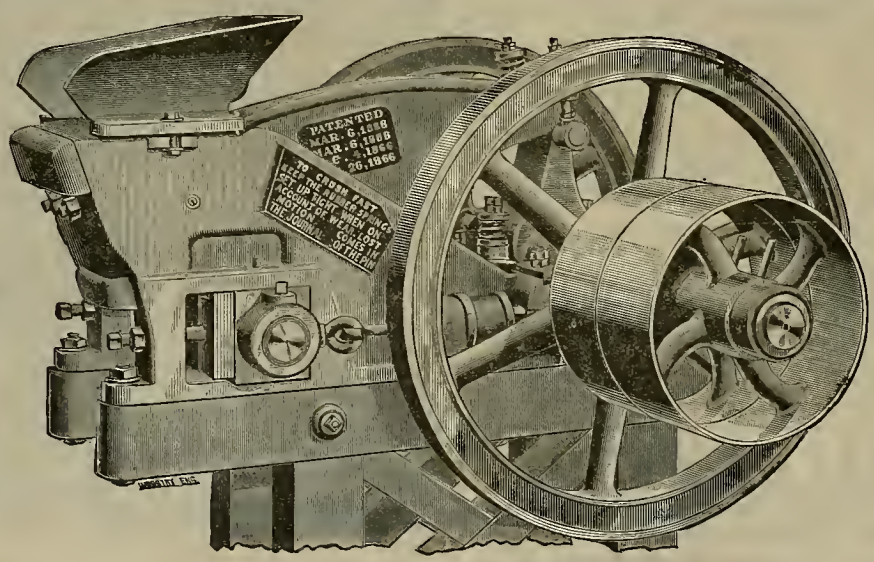
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We have opened our branch here with our specialties in CONCENTRATING MACHINERY and Appliances, and are prepared to investigate any proposition in the CONCENTRATION OF ORES.
Our work in COLORADO, MONTANA and IDAHO is successful, and we present mining men a proposition free from any experimental nature.
In many ways CONCENTRATING APPLIANCES IN COLORADO AND MONTANA are more successful than those at present employed on this Coast, and we think we can present a CONCENTRATOR which does not compete with any other, and that has received a cordial welcome from mining men.
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Write for Circulars.

FRUE ORE CONCENTRATOR

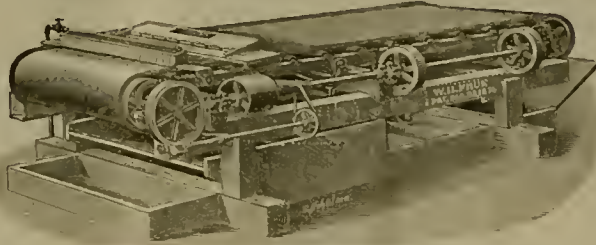
OVER 3000 IN ACTUAL USE.

We are now manufacturing these machines in different styles. The regular Four-Foot Plain Belt Frue Vanner is on the market now in its latest and most improved form, having several improvements on it that facilitate the work, altogether making it a perfect machine.

We are also manufacturing a Four-Foot Frue Vanner with a belt having an improved surface which doubles its capacity. This machine is as perfect in every way as the regular machine, and with its improved belt, it has double the capacity of the ordinary machine. We have sold a large number of these machines, and have demonstrated that they are a success.

The above figures of the number of machines that we have sold tell the tale of their popularity, and show that they have made their reputation by doing their work perfectly.

For any further information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.



Manufactured under Patents of April 27, 1880;

September 18, 1883; July 24, 1888;

and March 31, 1891.

Price of Plain Belt Frue Vanner, \$575, f. o. b.

Price of Improved Belt Frue Vanner, \$825, f. o. b.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., No. 132 Market Street, San Francisco, Cal.

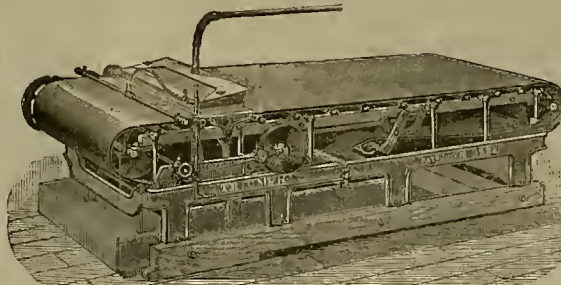
"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - \$650 f. o. b.

Price "Triumph" Concentrators, with Plain Belt - - - \$550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,

39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company, Principal Office, 401 California St., cor. Sansome, S. F. Location of Works, Grass Valley, Nevada Co., Cal. GRASS VALLEY, NEVADA CO., CAL., NOV. 10, 1886. Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, Jr., Signed]

Sup't North Star and Original Empire Mining Co. N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD. OVER 2000 IN ACTUAL USE.

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The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work.

All applications should state amount and head of water, power required and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

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It having come to the notice of the undersigned that their patent rights are being infringed upon, intending purchasers are hereby warned that all such infringements will be duly prosecuted. (Signed) THE PELTON WATER WHEEL CO.

THE PELTON WATER WHEEL CO. 121-123 Main Street San Francisco, General Western Agents.

S. N. KNIGHT.

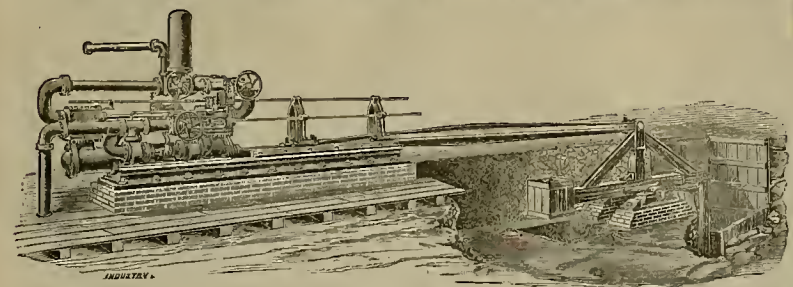
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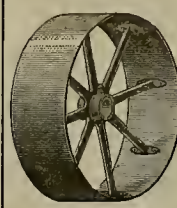
Dynamite and Blasting Powder,

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